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NOTICE

The Council have again decided to omit from the July *Journal* this year the usual Appendix containing the List of Fellows, Bye-Laws and Rules of the Society and the List of Donors to the Library.

For the information of Fellows and others concerned, a list is appended of the names and addresses of Fellows elected since July last year:—

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JOURNAL

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JANUARY, 1919.

Eugenics in Relation to Economics and Statistics.

By Major Leonard Darwin, Sc.D.

[Read before the Royal Statistical Society, November 19, 1918, Sir Bernard Mallet, K.C.B. (the Ex-President), in the Chair.]

I.—*All advances in civilization are likely to be accompanied by certain dysgenic influences.*

A distinction is now often drawn between pure and applied sciences, and this distinction is convenient even though no rigid line of demarcation can be suggested. Pure science deals with generalisations founded on facts, whilst applied science aims at the utilization of these generalisations for the benefit of mankind. These definitions might no doubt be improved, but accepting them for to-day, eugenics may be said to be that applied science which corresponds in its application to man to genetics in pure science. Now statistical investigations are needed in connection with both the pure science of genetics and with the applied science of eugenics; for indeed it was on the statistical foundations laid by Sir Francis Galton, together with the mathematical investigations of Professor Karl Pearson, that the building of practical eugenics was first commenced. Moreover, directly a science comes to be utilized in the service of mankind, it must come in contact with other branches of knowledge, such as economics, and it therefore appeared to me that it might be useful to see what conclusions could be reached by a broad and general conjoint survey of the fields of eugenics, statistics and economics.

The student of an applied science ought to take the widely accepted conclusions of his pure science colleagues as his starting point, and the eugenist should, therefore, begin by asking himself what are the generalisations widely accepted by biologists and geneticists. Differences of opinion no doubt exist with regard to the evolutionary process which has been in operation in nature. Some leading biologists hold that there is no ground for asserting that selective breeding can do more than multiply or diminish the fixed strains which in combination are found to make up a species. But even on this supposition selection might in the case of man produce extremely beneficial or harmful results. On the following three points there is, however, general agreement:—

(*a*) The germs (zygotes) of individual bisexual organisms of the same species are not all identical, at all events as regards whatever forms the foundations on which are built the qualities in which the individuals come to differ considerably from each other; the result being that wide differences exist between the hereditary endowments of different individual bisexual organisms.

(*b*) The offspring of each individual bisexual organism deviate on the average from the mean of the species in regard to their qualities in the same direction as the parents, though to a less amount; a conclusion at all events sufficiently confirmed by statistical investigations to throw the onus of proof in particular instances on those who deny its truth. (Further inquiries concerning mental heredity in man would be no doubt very desirable, whilst experiments on the mentality of animals, with their tabulated results, are not to be overlooked in connection with eugenics.)

(*c*) If in the possession of any quality considerable differences exist amongst adults, an increase in the rate of sexual multiplication of the types possessing on the average that quality to an extent above the mean would tend to increase (perhaps within limits) the extent to which it would on the average be exhibited by future generations; whilst the same result would be produced by a decrease of fertility of the inferior types.

This last postulate no doubt only deals with tendencies, or with effects which may be reversed by opposing tendencies. But that the tendencies thus postulated do exist follows, in my opinion, as an inevitable conclusion from the two first postulates; for the efficacy of selection by breeding can only be denied by asserting either that all germs are identical in regard to the quality in question, or that individual germinal differences are in no degree inherited. In short the time-honoured breeders' precept to breed only from good stock has been confirmed by modern science, and, applying these conclusions to mankind, the eugenist is, I believe, justified in asserting that in the absence of any extraneous counter-acting tendency, an increase or a decrease in the rate of multiplication in good homes would, as the generations succeeded each other, tend to increase or decrease the possession by the nation of those natural qualities which facilitate the formation of good homes; and this in whatever way the word "good" might be defined. In this conclusion we find a general indication of the methods of eugenics; and, in starting in quest of the reforms necessary to produce the desired racial improvement, our first inquiry should be to ascertain what are the causes which as a fact do affect the rate at which different types of mankind multiply on the face of the earth.

The rate of multiplication of a population depends on the difference between the rate at which numbers are added to it and the rate at which numbers are subtracted from it; that is on the difference between the birth and death-rates. Racial progress might be promoted, it would therefore appear, by producing a change either in the birth-rate or in the death-rate. As to the death-rate, if we could pick out all persons belonging to low biological types, and if we could greatly increase the mortality of the groups thus selected, we should certainly at first rapidly weed out the unfit, and the primary results would doubtless be highly eugenic. Our moral code, however, compels us to endeavour to preserve life in all cases, and to promote racial progress by means of what might be described as a differential murder system is entirely out of the question. We must not look to the death-rate as an agent in eugenic reform, and if anything can be done, it must be by the agency of the birth-rate.

What are the causes of the differences between the fertility of different groups of individuals of the same nation? This is the first question in reference to the birth-rate to which an answer must be sought, and in seeking it, the first point to be noted is that the birth-rate of a group depends mainly on the following four factors, namely (1) the marriage rate, or more correctly the proportion of the population who contract some kind of an alliance, legitimate or illegitimate; (2) the average age at marriage, age having a very marked influence on fertility in the case of women; (3) the intentional limitation in the size of families, and (4) the natural or physiological fertility of the group. Putting aside physiological fertility for later consideration, all the other factors are as a rule determined as the result of a balance being struck between opposing ideals and desires. The stronger in any group is the love between the sexes, or mere sexual desire, the higher will tend to be the marriage rate, and the lower the average age at marriage; and on account of either of these consequences the birth-rate of a group might tend to be relatively high. There are, moreover, other mental attributes tending to increase the birth-rate which have to be considered, namely, those which act by lessening the intentional limitation in the size of families; such as, amongst bad qualities, recklessness, selfish disregard for the prospects of children yet to be born, incapacity to take thought for the future, and a tendency to drink; and amongst good qualities, the desire for parenthood and the love of children. An unselfish affection for children may, however, have the opposite effect of increasing the tendency to family limitation; for both fears and ambitions in regard to the future prospects of the family may make a small family seem to be more desirable than a large one. Hence there are many diverse mental qualities, some good and some bad, which affect the birth-rate; and it is important to study these qualities because, again putting physiological fertility aside, it is only by acting on or through these mental attributes that the birth-rate can be affected in such a way as, without compulsion, to produce a change in the rate of multiplication of any section of a nation.

If we look, not to these mental qualities in themselves, but rather to the external agencies which may act on them, we shall see that of all the factors affecting the birth-rate, wealth is the most important. All wealth, but especially recently acquired wealth, makes marriage more possible, thus tending both to lower the age at marriage and to increase the marriage rate; whilst any increase in income may lessen the apprehensions caused by a growing family and may thus diminish the desire to limit its numbers. We must, however, draw a very clear and sharp distinction between increasing wealth and a fixed relatively high level of wealth. Whether a man feels rich or poor has little to do with the actual amount of the wealth he possesses; for his sensations in this respect depend almost entirely on a comparison between his own income and the average income of the social class to which he considers himself to belong. In the same way it is not an actual increase in riches but rather an increase in the sensation of wealth which would tend to diminish the impediments in the way of marriage and parenthood. If an increase of wealth is to increase the birth-rate of any section of the community, it must be of such a nature as to make the bulk of the members of that class feel that the expenditure necessary to enable them to live their accustomed lives will in the future absorb a smaller proportion of their incomes. The habits of a class, however, slowly but surely fit themselves to the average income of that class; and when a very slow change in average wealth takes place, the change of habits will very nearly keep pace with the change in wealth, and but little effect on the birth-rate will in these circumstances be produced. To materially affect the rate of multiplication of any social class, an increase or decrease in wealth must, therefore, be fairly rapid; and in times of peace such changes in average wealth are not of frequent occurrence.

The effect of remunerative harvests on the marriage rate in bygone days has often been quoted; but a statistical proof of the existence of a correlation between *changing* wealth and the birth-rate now presents considerable difficulties. Would it be possible by extensive individual inquiries to ascertain if a correlation exists between the size of the family and the rate of wages *within the same social group?* This might help to solve the problem; for *exceptionally* high wages generally imply an exceptional rise in wages. The knowledge thus obtained might, moreover, be of great importance with reference to any proposed socialistic legislation.

If, leaving out of account the effects on the birth-rate of increasing or decreasing wealth, we pass on to consider the differential effects as between various social groups of the differences in their fixed levels of wealth, then we shall find that as a fact greater wealth is found to be associated with a lower and not with a higher birth-rate. Increasing wealth and a permanent increase in wealth seem to have opposite influences on the birth-rate, the clue to this reversal of effect being found in the fact that wealth affords facilities and slowly gives rise to the habit of indulging in certain pleasures which compete with the joys of marriage and parenthood. The well-to-do can indulge in a number of pastimes, such as games, sports, travel, society, &c., &c., to a far greater extent than is possible in the case of those with more narrowly limited incomes, and therefore with less leisure. If amongst the young these pleasures come to be a fixed habit, then they will not readily be abandoned; and as both marriage and parenthood will in most cases interfere to a certain extent with such pursuits, the possession of inherited wealth will generally tend in a measure to lower the birth-rate. Amongst the rich the temptations to immorality are, moreover, greater than amongst the poor, and dissolute habits greatly lessen average fertility. Then, as to the poorer classes, the working man, who toils all day long and all through the year, will lose few pleasures as the result of home ties; and great poverty and a high birth-rate inevitably tend to go hand-in-hand. In short, the pleasures which money and leisure facilitate often have to be lessened on marriage, and wealth is the rival rather than the ally of parenthood.[1]

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[1] *Wealth and Welfare*, Pigou, chap. iv; *Economic Journal*, vol. xx, Professor Brentano on the "Doctrine of Malthus."

Wealth also tends to be correlated with a low birth-rate for less obvious reasons. Education and culture often suggest pursuits and ambitions which are not open or apparent to the uneducated, and which, since they either involve expenditure or need the leisure that wealth affords, are more easily indulged in by the unmarried and the childless than by the married and the parent. Education also opens out possibilities of future advancement, necessitating long periods of training and employment, before the maximum salary attainable can be gained; and this causes the well-to-do often either to postpone marriage until their incomes are sufficient to enable a home to be started somewhat nearly on the lines which seem likely to be ultimately within the range of possibilities, or to "economize" at first by limiting the size of the family. Higher education in the case of women, by opening out increased possibilities of an independent life, is especially likely to act as a rival to parenthood. The day labourer, on the other hand, whose wages depend on the use he makes of his muscles and not of his brains, will receive his maximum wages when he is young, and will have no similar inducements to delay taking to himself a wife. Thus we see that, on the one hand, the training of the mind increases the probability of thoughts of marriage being postponed to a later period of life, a period when increasing fixity of habit is likely to make the inevitable risks accompanying marriage and parenthood appear to be increasingly formidable; whilst, on the other hand, labour dependent solely on bodily strength is apt to lead to early marriages and a high birth-rate.

In future statistical inquiries as clear a distinction as possible should be drawn between welfare derived from the possession of wealth capable of being diverted from one use to another by the individual possessing it, and welfare derived from benefits not thus transferable. If the views here advocated are sound, the correlation with the birth-rate should prove to be in the one case negative and in the other positive; and whether or not this is so should be ascertained if possible.

In social groups where good incomes are earned or where wealth has been accumulated, there opportunities for leisure and education will be forthcoming; and in such groups for the foregoing reasons we should expect to find a lower birth-rate than where contrary conditions prevail; a theoretical conclusion practically confirmed by a large number of careful inquiries.[2] The possibility that this indisputable relationship between economic status and fertility may be due in part to differences in natural or physiological fertility must, it is true, not be overlooked ; for, as we shall see, reasons may be given for believing that the well-to-do are likely to be naturally less fertile than the very poor. Other things being equal, it is a mere truism to state that the naturally infertile will on the average have smaller families than the naturally fertile ; and this being so, it is obvious that the members of the smaller families of the naturally less fertile will be more easily provided for, and generally given a better start in life, than will be the case with the larger families of the more fertile.[3] And as fertility is certainly a quality transmitted in a measure from generation to generation by natural inheritance, the tendency thus established for the less fertile stocks to be continually selected out of the poorer into the richer grades of society, will result in infertility and wealth tending to become more and more closely correlated. The large dowry given to the daughter in a family both small and wealthy was indeed long ago recognized by Sir Francis Galton as acting as a premium on the marriage of the naturally infertile.[4] Though we must therefore admit the probability that the low birth-rate amongst the well-to-do classes is in a measure due to their lack of natural fertility ; yet, on the other hand, certain recent investigations, especially those conducted by the Galton Laboratory,[5] in my opinion conclusively prove that the differences in the sizes of the families in the different economic strata of society are mainly due either to the differences in the average age at marriage, or still more to the differences in the extent to which voluntary limitation is practised. We have, in fact, no reason to doubt that wealth is correlated with a low birth-rate on account of the mental qualities of parents, and therefore for causes which are amenable to external influences.

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[2] Drapers' Company Research Mems. "Relation of Fertility to Social Status." Heron. Galton Lab., 1906.

The possession of wealth is, therefore, a factor which tends to lower the birth-rate. But this same factor also obviously tends to lower the death-rate by facilitating the creation of better surroundings ; and it follows that the relative rate of multiplication of the richer and poorer classes depends on which of these two opposing tendencies prevails. According to the Galton Laboratory researches, until some half century ago the higher death-rate amongst the very poor more than counterbalanced their greater fertility, but both the improvement in their conditions of life and the relatively greater fall in the birth-rate of the wealthier classes have now resulted in an unquestionably greater rate of multiplication amongst the poor than amongst the well-to-do; for example, amongst the skilled artizans in comparison with the dwellers in the slums. Granted that our scientific knowledge justifies us in asserting that a low rate of multiplication of any section of a community tends progressively to decrease the extent to which the qualities characteristic of that section will be exhibited by the nation in the future, it is, therefore, obviously important to ascertain what are the inborn qualities which are associated with the possession of wealth. Now it cannot be denied that numbers of those characterised by certain marked tendencies, such for example as the tendency to disease, crime, idleness, drunkenness, reckless expenditure, &c., together with the mentally defective, do continually keep falling out of the ranks of the well-to-do into the poorest social groups, whilst those endowed with certain valuable qualities, especially perseverance and the power of taking thought for the future, do keep rising in the scale of society as graded by wealth. And as we have seen that innate qualities always count for something in such selective processes, it follows that, in the absence of any forces producing an opposite effect to a sufficient extent, the groups earning salaries or wages above the average must be endowed to a degree above the average with these and other less easily recognizable qualities which facilitate success in life; qualities which may be conveniently grouped together under the title of innate wage-earning capacity. Both the wealth won and the power of winning it are transmitted to the next generation, the one by right of bequest or in the form of superior education and training, and the other by natural inheritance, thus tending to pass on this correlation between wealth and wealth winning qualities to posterity. Moreover, the production of small families, which we have seen is characteristic of the wealthy, facilitates the maintenance of a high level of wealth amongst the descendants of the well-to-do. Thus we see that a selective process is now in operation, continuously tending to maintain and increase the correlation between the winning of high salaries or wages and innate wage-earning capacity.

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[3] "Human Fertility," J. A. Cobb, *Eugenics Review*, iv, p. 378.

[4] Has a statistical comparison been made between the proportion of childless marriages amongst families with hereditary titles and that amongst the general population, taking the age at marriage into consideration ? The difficulty for allowing for the capture of heiresses by the possessors of titles might render such an inquiry useless. See Galton's *Hereditary Genius*, p. 130. Would a similar inquiry as between the different social strata be more possible ? Few persons desire no children, and this problem might thus, perhaps, be somewhat elucidated.

[5] Report on the English Birth-Rate. Part i, England. Eugenics. Lab. Mems. xix and xx.

To actually prove the existence of a correlation between earnings and innate capacity is exceedingly difficult, because it is nearly always possible to attribute the differences between different individuals to differences in their past surroundings. To compare the proportion of the total child population who are educated in special schools for defectives with the amount raised per head by rates in different districts would be instructive, because certain forms of defectiveness can hardly be attributed to environment. The mentality of the children in ordinary schools in different areas should be compared by the Binet-Simon or other tests; though it must be remembered that precocity is but an uncertain guide to ultimate success.[6] Similar comparative inquiries should be made with regard to the incidence of crime, drunkenness, epilepsy, consumption, &c.; though environment doubtless counts for much in producing these defects. It would be very desirable if it could be ascertained with regard to any human defect whether it is possible to attribute it wholly to environment; and in this connection it is worth noting that Mr. R. A. Fisher has recently pointed out that the differences between paternal and fraternal correlation coefficients do afford a possible means of disentangling the effects of heredity and environment.[7] In most cases this method of investigation would be difficult to apply; but if, for instance, criminal statistics were to be further developed on right lines, it might be possible to prove in this and similarly in other cases that environment is not the only causative agent. And if it were to be proved that certain human defects must in part be attributed to heredity, and also that the incidence of these defects is correlated with the rate of wages, then it would be established that a correlation does exist between wages and innate wage-earning capacity in certain respects, even though this correlation could not be measured.[8]

The existence of a relationship between the innate power of winning wealth and the possession of wealth being admitted, ought we therefore to accept the possession of wealth as a standard by which the value of innate human qualities may be judged? Thus to form unqualified judgments of human beings would of course be both degrading and dangerous. But if due weight is always attached to higher considerations, we should not be afraid of paying some attention to economic standards. No doubt amongst that admirable body of social workers, who are devoting their whole energies for the benefit of their fellow-creatures, there exists a strong tendency to revolt against wealth even being mentioned in connection with human qualities, and for this tendency two explanations may be offered. In the first place all those who work amongst the poor come across large numbers of persons endowed with most excellent qualities, and any statements which seem to disparage this whole class are naturally and rightly resented by them. But when such resentment is concentrated on the eugenist, it indicates a complete misconception of the eugenic attitude ; for our contention, namely, that the poorest groups contain the highest *proportion* of the biologically unfit, is concerned only with averages and not with individuals. The eugenist should, it is true, freely admit that wealth is likely to be accompanied by certain undesirable qualities, and he should regulate his policy accordingly. Ruskin has told us that the "persons who remain poor are the entirely foolish, the "entirely wise, the idle, the reckless, the humble, the thoughtful, the "dull, the imaginative, the sensitive, the well-informed, the im-"prudent, the irregularly and impulsively wicked, the clumsy knave, "the open thief, the entirely merciful, just and godly person."[9] This statement may be accepted if a certain allowance be made for rhetorical exaggeration and if the contrast held in view be that between, on the one hand, those who have succeeded in winning for themselves great riches and, on the other hand, not only the dwellers in the slums but also all those who have remained contented with a modest income. But would thoughtful, sensitive or entirely godly persons ever wish to marry under such conditions that their children would in all probability have to be brought up in the slums ? If not, there must exist a certain tendency for these good types to be eliminated from the slums. Generosity is also another good attribute of the poor ; but generosity so ill-regulated as to bring the donor's family to actual want is hardly a desirable attribute; and if wealth creates a tendency amongst the well-to-do for such qualities as kindness, sensitiveness, æsthetic imagination, &c., to be accompanied by an adequate dose of common sense, this surely is an advantage.

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[6] "Distribution of Educational Abilities." Burt, p. 65. *L.C.C.* 1917. *British Journal of Psychology.* Vol. iii. Burt, 1909; Weintrob, *Journal of Experimental Psychology,* 1912, p. 576.

[7] "The Correlation between Relatives on the Supposition of Mendelian Inheritance." R. A. Fisher, *Trans. R.S. of E.*, vol. lii, part ii, 15.

[8] This assumes the absence of opposing partial correlations; that is to say, that for a constant degree of defect, on the average higher wages are not earned by those possessing inferior innate wage-earning capacity.

Another argument against even considering the probability of the richer social strata being superior to the poorer groups in innate wage-earning capacity is that the existing differences in the wealth owned by the various sections of the community produce such marked differences in their possibilities of advancement that all other points of difference should for the present be neglected. But granted that the need for a more uniform distribution of wealth is great, this forms no reason why reforms producing beneficial racial tendencies should not be simultaneously advocated. The inheritance of wealth certainly greatly lessens the number of transfers between the different social grades; but since inherited wealth merely hinders this flow, the existence of this friction does not invalidate the foregoing arguments. The only valid argument known to me in favour of the belief that the poor are innately superior to the well-to-do is that the higher death-rate to which they are subject makes the selective process act with greater severity in their case. The correlation between the death-rate and innate efficiency is, however, probably low. Moreover, we are rightly doing our best to lessen this selective death-rate, thus lessening the force of this argument as regards the future. In this connection we may ask what is the aim to which social reformers, looking only to environment, wish us to devote our main attention? Is not their main object to insure that all citizens should have equal opportunities for advancement in life? If this be so, what would be the result if their efforts were to be perfectly successful? If after once having entered the world, the conditions here were to be precisely the same for all men, the differences in their careers would then obviously entirely depend on something which made them differ from each other on entering the world, or on the differences in their inborn qualities. In these circumstances all differences in economic awards would depend exclusively on differences in inherent qualities, or on differences in qualities which are obedient to the laws of natural inheritance. If our civilization is moving in the direction of greater equality of opportunity, then social reformers ought at all events to admit that wages are likely as time goes by to give a more and more correct indication of innate wage-earning capacity.

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[9] Unto this Last. *Ad valorem*, p. 128.

We have, therefore, been led to the conclusion that the possession of wealth is now correlated both with a low birth-rate and with innate wage-earning capacity. This being the case, the natural qualities which make for economic progress are correlated with a low birth-rate; and from this it follows that wealth, the most important external factor affecting the birth-rate, is acting as a kind of filter, filtering out from the nation all those natural qualities, be they good or bad, which are making for material progress.[10] But thus far we have at all events seen no reason for anticipating that any general advance in economic conditions would necessarily be accompanied by an increase in the rate of racial deterioration; for if all the different sections of the community were to advance equally in wealth, the birth-rate might be affected similarly throughout the whole nation and no differential effects might then be produced. Unfortunately it is almost certain that neither economic conditions nor civilization generally are likely to advance in this uniform manner; for any efforts to increase the wealth and culture of the people will always be least successful amongst the lowest biological types, they having little or no power of retaining any wealth that may be transferred to them, and their want of capacity for acquiring culture being the very measure of their unfitness. Every effort at social reform will tend to separate out more clearly those groups innately more capable of social and economic progress from those innately less capable, and this greater differentiation in innate capacity will be accompanied by a greater differentiation in the birth-rate. Every advance in material civilization is, therefore, likely to be accompanied by an increase in the existing dysgenic effects which result from a lower birth-rate obtaining amongst those capable of earning better wages.

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[10] Here I have assumed that for a constant degree of wealth, higher innate wage-earning capacity is not *at the present time* on the average associated with a higher birth-rate to a sufficient degree to render this conclusion false. This

II.—*To combat the dysgenic effects of wealth, the size of families should be regulated with reference to wage-earning capacity.*

If it be true that civilization is unlikely to proceed without increasing the dangers of racial deterioration in certain directions, ought we not, therefore, to pause before we make any further attempts to advance along this dangerous path? Certainly not, and this for many reasons. In the first place, if we were to endeavour to put obstacles in the way of all those who were trying to win for themselves more wealth, leisure, or education, we should succeed better with the unfit than with the fit, thus producing effects both immediate and racial the opposite to those which we desire. We cannot, even if we would, call a halt all along the line. Every proposed course of action—or inaction—has its dangers, and to abandon all attempts to win a higher civilization would be a foolish and cowardly surrender to fate, which no one ought to advocate.

is disputable, and I should be glad to find myself in error. If all men were born equal in regard to wealth and opportunities, good innate qualities would in some ways promote a high and in some ways a low birth-rate. But in the existing moral atmosphere, where higher education comes to be correlated with a lower birth-rate, this conclusion in regard to the existing correlation between a low birth-rate and high innate capacity seems to me to reach a very high degree of probability; though my hope is that moral reform may in future make it false.

We must continue to advance, but in doing so we are imperatively bound to endeavour to insure that every reform shall be accompanied by such safeguards as will protect posterity from any racial injuries resulting from the actions which we are taking in our own interests to-day.

Since we cannot act through the agency of the death-rate, the racial safeguards which we are searching for must be found in making the birth-rate of the different types of mankind vary in accordance with their innate worth. If this relationship between innate qualities and the birth-rate could be established, then the higher biological types would multiply with a rapidity corresponding to their racial values, the fit would be continually displacing the unfit and racial progress would be assured and rapid. The possession of wealth has, as we have seen, a powerful differential effect on the birth-rate as between the different economic strata, and this fact taken alone might tempt us to urge that poverty should always be the fate of the fit, whilst the unfit should be freely endowed with riches. But as regards immediate effects, to reward inefficiency more highly than efficiency would be a hopelessly retrograde policy; for if men are to make the best use of their opportunities, it is essential, human nature being what it is, that they should be offered higher wages for better work. Moreover, it must be remembered as regards racial effects that though the birth-rate of a class would decline with an increase in its average riches, yet the fertility of each individual would probably increase with an increase in his wealth in comparison with that of his associates, and that not to permit higher monetary rewards to be allotted to those who do the best work within each social class would be in this respect dysgenic. It is very unlikely, it is true, that the existing harmful racial effects of the differential birth-rate as between the different economic strata could be entirely obliterated by any system of individual rewards for work done, and we must face the disagreeable fact that a certain dysgenic tendency will always be produced by a system of rewards calculated to adequately stimulate human productivity. We have to ask ourselves, therefore, how these conflicting considerations ought to be met, and in the attempt to solve this knotty problem, the following laws are suggested for consideration as being those which should be followed in order best to combine immediate social progress with the least possible racial injury:—

(1) The more useful the work performed, the higher should be the monetary rewards; but wages and salaries should only be sufficiently differentiated to insure that the average worker would strongly desire to do the more useful work.

(2) The size of the family should be limited with reference to the wages or salary earned and to be earned for work done.

The main aim of the first of these laws is to secure immediate environmental benefits, whilst insuring as uniform a distribution of wealth as is compatible with advancing civilization. Taking the two laws together, we see that if wages were to be correlated with the utility of the work performed in accordance with the first law, and also to a sufficient degree with the size of the family in accordance with the second law, we should thus establish a correlation between the size of the family and the utility of the work performed,[11] and as the utility of the work performed is to some extent correlated with the innate wage-earning capacity of the worker, it follows that by obedience to both these laws the desired relationship between fertility and innate worth would be in a measure established. Granted that the first law is necessary for the maintenance of our existing social order, the second law, in fact, seems to be necessary in order to insure racial progress. And to make men obey this second law, that is, to make the rate of multiplication correspond with wage-earning capacity, forces must be set in motion which would produce a differential effect on the birth-rate in the contrary direction to, and sufficiently powerful to overcome, that produced by wealth on the different economic strata.

These laws are, no doubt, in existing circumstances somewhat of the nature of a counsel of perfection; but they do point to the direction in which we should endeavour to advance.

As to limiting the output of children with reference to future economic prospects, it is obviously desirable, even without reference to racial effects, that the size of the family should be limited in accordance with the possibility of bringing up the children in such physical and mental conditions as will impose no obstacles to the full development of their powers. That this is the duty of all parents is now beginning to be recognised, though those who limit their families to this extent *and no more* but rarely perceive that they are acting on eugenic principles. That racial benefits would thus be produced must be admitted by all who hold that earnings and innate worth are in any degree correlated; for, this being granted, a general limitation of the sizes of families in reference to the probable future incomes of parents would result in the less fit multiplying relatively somewhat more slowly than is now the case. Our aim should not be, it is true, to divide human beings into two camps, the sterile unfit and the fertile fit; because no rigid line of demarcation can be drawn between the fit and the unfit. Where serious heritable defects are known to exist, unquestionably all idea of parenthood should be abandoned; whilst, when the innate defects are problematical, the size of the family ought merely to be limited with a common sense regard to the probabilities of the case. In regard to the inheritance of disease there is still an immense field almost unexplored, and for this purpose insurance statistics would prove an invaluable mine of information if explored by a trained statistician. Here we are mainly, however, concerned with economic considerations, and if by voluntary limitation the size of families could be made to be dependent on future economic probabilities, a desirable graded relationship between innate worth and the rate of multiplication would thus in some measure be established, granted that innate wage-earning capacity and the wages actually earned are not wholly uncorrelated.

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[11] Here again partial correlation coefficients have to be held in view, and here the question is whether, if wages were constant, greater utility of work could be associated with smaller families. The fact that love of pleasure and a tendency to vice tend to lower the birth-rate militates against this possibility. On the other hand, the more absorbed a man is in his work, the more likely he is to postpone his marriage, and thus to reduce the size of his family. In so far as tendencies of this latter type are likely to prevail, they must be met by greater efforts to promote the correlation between the size of the family and wages. I am not here considering State aid to parenthood, which opens out a different set of problems.

To what extent can human beings be persuaded to limit, by any method which they may think right, the size of their families in accordance with their economic prospects? It has been suggested that if a knowledge of the methods of birth control were to be widely disseminated amongst the poor, the result would be that their birth-rate would fall to the same low level which it has already reached amongst the well-to-do. An investigation of the correlation between birth-rate and social status in the large towns in Holland, where birth control is said to have been widely advocated, might prove instructive, especially if conducted on lines similar to those adopted by the Galton Laboratory. The relationship between a lower birth-rate and a higher level of wages and salaries in the different social strata is, however, such a widespread and well-established phenomenon, and can be so satisfactorily explained, that this correlation is very unlikely to be reversed as the result of any birth control propaganda. Then again the slums contain a high proportion of the biologically unfit, including those who are actually or nearly incapable of taking due precautions in view of future contingencies, however much trouble they might thus be saved; and voluntary limitation is, therefore, likely to be least practised in those localities where it is most needed. Every effort should be made to persuade the poor to limit their families in accordance with their means; but though it is to be hoped that great success would attend this propaganda, yet the foregoing considerations point clearly to the conclusion that the dysgenic differential effects of wealth on the birth-rate could only thus be somewhat lessened.

How then are we to deal with those types which are untouchable by moral persuasion? Segregation without the right of parenthood is now universally admitted to be justifiable in certain cases, including that of idiots, the feeble in mind,[12] the insane,[13] the hopelessly criminal,[14] &c., and the question now in effect raised is as to the extent to which this practice might justifiably be extended. Moreover we have to enquire what should be done with those of whom it can only be stated in general terms that they are living in a state of degradation. No doubt a demand will be made in certain quarters for every assistance being given to the poor which would enable them to live civilized lives, and this without any conditions being attached, at all events as regards parenthood; and it must be freely admitted that it is exceedingly difficult to decide how much money may be legitimately extracted from one class in order to give unconditioned benefits to another class. The answer should depend on what will be best for the nation as a whole; and if the matter be regarded in this broad light, the fairness of placing even a considerable weight of taxation on the well-to-do in order to raise the condition of the degraded classes cannot possibly be denied. But if this assistance were to be unlimited in quantity and unaccompanied by any conditions whatever, would not the result be a rate of multiplication entirely unchecked by economic considerations amongst those classes which are not only least capable of self-support, but which also contain the highest proportion of persons marked with heritable defects? Would not this throw a continually increasing economic strain on the nation, and also increase the probability of progressive racial decline? If the individual has only the right to demand what the State ought in the interests of the nation as a whole to give, then the individual cannot have the right to demand assistance from the State without any limitations whatever in regard to parenthood.

In these discussions concerning the possibility of the State taking further measures in order to diminish the rate of multiplication of the less fit, we have been entering a region where further progress

[12] "Mental Deficiency," Tredgold.

[13] Drapers' Company Research Mems. v. "Inheritance of Phthisis and Insanity," Goring, 1909. "Heredity in Relation to Insanity," Mott. Adlard and Sons, 1912.

[14] "The English Convict. A Statistical Study," Goring, Stationery Office, 1913.

is difficult or impossible until certain basic questions have been decided. We rightly lay great stress on the principle of individual liberty; but ought that liberty to involve the right to live a life which is injurious to others in consequence of its economic or morally contagious effects? Is it to be left entirely to the discretion of the individual endowed with heritable defects whether to risk passing on those defects to the coming generations? Or should this question, like the question of what is lunacy, be decided by experts, with ample safeguards as to rights of appeal? Is there, in fact, an unlimited right of parenthood on the part of all? And if parenthood may be prohibited by the State, how is this prohibition to be practically enforced? Is segregation the only method, or are there other methods available which are more humane and which interfere less with freedom. Eugenic reform would be greatly facilitated if decisions were not only to be reached on all these points but were also to be widely endorsed by public opinion; and it seems, therefore, that for the moment the main object of eugenists should be to force on a discussion of these fundamental questions.

Pending further light on these difficult topics, progress in certain directions is, however, still possible, more especially in pressing forward reforms now in progress or under consideration which have or would have beneficial racial consequences. Firm steps against overcrowding should be combined with adequate and comfortable accommodation for the mentally defective and for those suffering from serious heritable defects; labour colonies should be established for the work-shy, where it could be ascertained whether the incapacity of the inmates was curable or more probably due to inborn defects for which they could not be blamed; short sentences to criminals should as far as possible be abolished, the habitual malefactor being treated as an irresponsible being; more adequate methods of dealing with hopeless inebriates should be adopted; and in all these cases parenthood should be effectively prohibited. Here is work enough for reformers for some years to come.

III.—*To lessen the anxiety of parents as to the welfare of their yet unborn children would be the best economic method of encouraging the production of larger families where desirable.*

Passing on to consider the methods of increasing the rate of multiplication of those classes where a fairly high birth-rate would be advantageous in view of future economic prospects, this result could, I feel convinced, be attained to a considerable extent by purely moral forces. The duty of filling the ranks of the nation with efficient citizens has been forced on the attention of all patriotic men and women by the war, and the enforcement of this obligation with religious zeal would have a material effect in lessening the voluntary limitation of families amongst the well-to-do. The spread of a knowledge of eugenic principles would greatly reinforce such a propaganda, because the danger of national deterioration on account of a low birth-rate amongst the best biological types would be more widely appreciated. Other moral precepts now widely taught, but insufficiently accepted, would also tend to have unsuspected racial benefits. If outward display based on mere wealth came to be less prized, if the young could be brought to think less about costly amusements, if we were all to pay more attention to moral and intellectual qualities and less to mere social standing in the selection of our friends, then the possession of wealth would have less tendency to reduce the birth-rate; because the things obtainable by wealth, being less sought for, would interfere less with marriage and parenthood. We are bound for practical reasons to make the monetary rewards to human beings bear some relationship to the value of their services to the community, but the more we base our estimate of our neighbours on their moral qualities and the less on their outward display, the better it will be for our race in the future. The moralist, unknown to himself, is often a worker in the field of eugenics.

In these discussions it is necessary to bear in mind the fact that in recent years the diminution in the output of children amongst careful citizens has been due far more to the intentional limitation in the size of their families than to any increase in the proportion of those who do not marry. An increase in taxation is therefore likely to be quickly followed by a fall in the birth-rate, because the resulting increase in the economic pressure on households being felt at once, would soon produce an increase in voluntary limitation. No doubt an increase of taxation would be equivalent to a decrease in the level of the wealth of the groups affected, and it would, therefore, ultimately produce a tendency in the opposite direction; but any rise in the birth-rate thus caused would be slow in making its appearance, because it would depend on the gradual disappearance of the hopes of enjoying certain pleasures which in the days of greater prosperity had competed with marriage and parenthood. Moreover, there are many comparatively cheap pleasures which compete to a certain extent with the pleasures of family life; and the rise in the birth-rate consequent on the enforced abandonment of these cheap pleasures would not be felt to the full until a state of extreme poverty had been reached. A decrease in wealth due to heavy war taxation, in so far as it fell on the fit, would, therefore, do certain and immediate harm, whilst the ultimate racial benefits would be both distant and problematical. Then again any fall in the birth-rate amongst the more fit, due to their wealth temporarily decreasing by a certain amount would be likely to be greater than the rise in the birth-rate which would result from their wealth temporarily increasing by a like amount ; for decreasing wealth produces results which the prudent cannot for a moment ignore, whilst the wise would generally make no change in their habits on account of any increase in their wealth until time had proved that it was not a mere temporary benefit. A mere oscillation in wealth, finally leaving the community at its original level of riches, would therefore produce an injurious fall in the birth-rate of the well-to-do. Though these considerations cannot be made the foundation for any demand for the permanent maintenance of any particular group of the community at its existing level of wealth, it does appear that stability in economic conditions is highly desirable on eugenic grounds, or, in other words, that all changes affecting wealth should be brought about very slowly.

The foregoing conclusion certainly does not, however, imply that it is impossible in any way to regulate the distribution of wealth so as to reap eugenic benefits thereby. Conscientious parents often limit the size of their families in view of the welfare of their yet unborn children, and it follows that the best method of increasing the size of families in careful households would be by lessening the just apprehension of parents in regard to the difficulties to be anticipated in bringing up their children in due comfort. These difficulties depend not only on the amount of funds available, but also on the strength of the other competing demands on the family exchequer, including the demands due to various pleasures involving expenditure. When regulating the family budget, few persons pay any attention to the habits of those outside their own social circle, and in order to increase the birth-rate, what is needed is to make it easier for parents to continue to live the same kinds of lives as those of their immediate associates. The unmarried, the childless, and the parents of very small families will be those who will have least difficulty in indulging in expensive amusements, and it will be they who will be most likely to set the pace in the matter of luxuries. In order to increase the size of families, what is wanted is, therefore, that money should be transferred *within each economic group* from those who have not married, or who have greatly limited their families, to the parents of larger families.

With these considerations in view, eugenists have often urged the advantages which would result from a material increase in, and a change in the methods of assessment of the allowances now made on account of their children to the payers of income-tax; this being a class of persons who for the most part have shown themselves capable of earning a sufficient income to support a family. The present allowances are rightly made to depend on the number of the children in the family; but unfortunately they are calculated on a flat rate and are the same whatever may be the income of the parent taxed, provided it is under 1,000*l.* a year, above which limit all allowances cease. A preferable method would be to make the allowances depend both on the number in the family and on the income taxed, the loss to the revenue thus inevitably involved being made good by an increase in the rate at which incomes were taxed; a reform which would not necessarily cause any further transfer of wealth from class to class. Such an adjustment of taxation would lessen the expenditure on luxuries incurred by income-tax paying non-parents, and it would diminish the apprehensions of all income-tax paying parents in regard to their families, thus increasing the birth-rate in a manner desirable on both economic and racial grounds. Whether it would be possible in a similar manner to give rebates of rates dependent on the number of children is more doubtful; but if it were possible, the results would also be beneficial in certain respects. A growing family would then be able to move into larger quarters with less additional rent to pay, and this would tend to somewhat lessen the temptation of parents endowed with the capacity for forethought to limit the size of their families, whilst it would not act as an actual premium on parenthood. It would be advantageous if, in future, returns were to be compiled by the government showing the sizes of the families for which rebates are given, thus affording a method of comparing the fertility of those who pay income-tax with those who do not.

In all endeavours to increase the rate of multiplication of desirable types by removing the apprehension of parents, one difficulty has to be borne in mind which is very likely to be overlooked. If the State opens out new possibilities for their yet unborn children before the eyes of married couples, it will be seen on consideration that the effect may be to decrease and not to increase the average size of their families. If in consequence of any reform it should become possible for a parent to benefit a small number of his children to an increased extent at a given cash cost to himself, then his hopes of being able to push forward a few of his children far to the front might thus be increased, and his desire to benefit his family by limiting its number might be strengthened rather than weakened. For example, unless a scholarship covers the whole cost not only of education but also of maintenance, which is rarely the case, the long education needed in order to reap the full benefits of the prize involves a considerable expenditure on the part of the parent; and any prospects of help in the shape of an increase in the number of scholarships for which children would be able to compete, might have the effect of stimulating the ambitions of parents and of increasing their desire that the family should be small enough for all its members to be able to make full use of all opportunities offered; a tendency which would be most felt and would do most racial harm if the children already born had shown considerable promise. In fact the offer of scholarships, like many other civilizing agencies, might decrease the birth-rate of the classes affected. On the other hand if larger grants were to be given to secondary educational establishments in such a manner as to cheapen the education of all children independently of their individual merits, an opposite tendency might be produced; for parents might thus be made to feel greater security that all their children, even if fairly numerous, would be able to gain incomes as large as those which they themselves were enjoying, in which case they might be less rather than more tempted to family limitation in consequence of this educational expenditure. Whilst expenditure such as that on education may often be confidently demanded in regard to its immediate effects, it may yet, therefore, be very difficult to forecast its racial consequences. As a general principle it is, however, clear that the more nearly State aid is made proportionate to the number in the family, and the more nearly, whilst it lasts, does it cover the whole cost of the upbringing of the children, the greater will be its effects in encouraging parenthood, a result only to be desired in the case of the more fit.

IV.—*In considering the dangers of an increase in the population, it is the facility of supply rather than the amount of food available which should be held in view.*

We have seen that the main aim of the eugenist is both to check the fertility of the less fit and to promote parenthood amongst the more fit, the one endeavour obviously tending to decrease the population and the other to increase it; and this propaganda ha been attacked on account of both these contradictory possibilities Those who dread an increase in the population often base their arguments against trying to increase the fertility even of the more fit on the necessity of maintaining a certain ratio between the food produced and the number of the mouths which the food has to feed; a contention which not infrequently covers a certain ambiguity of thought. If the whole energy of mankind were to be devoted to obtaining the necessaries of life, the inevitable result would be an entire disappearance of material civilization; because a man whose possessions do no more than keep him alive is but a savage. Moreover progress whether in morals, knowledge, or the arts rests to no small extent on a material basis, and for the manufacture of the necessary materials for such progress there must be an available surplus of time and energy. Since food is the main necessity of life it may, therefore, be broadly stated that civilization is dependent on the time which human beings have to spare for other objects, after they have supplied themselves with food, or on the facility of the food supply. For instance, comparisons have recently been drawn between the numbers of persons fed by English and German farmers respectively, whereas what we want to know is rather the energy value of the food produced per head of the agricultural population. For if we were to deduct from this figure the energy values of the foods *needed* per head for agriculturists—not what they actually *consume*—we should obtain figures representing the relative amounts of surplus " energy " per head which might fairly be made available for the various needs of civilization.[15] What we have to consider in regard to the effect of any reform on food supply is, therefore, whether it would render that supply more difficult or more easy.

The available methods of facilitating the supply of food may be divided under three general headings. In the first place there is the obvious method of diminishing the labour involved in the supply of food by improving the means both of production and of distribution, either by new inventions or by an increase of knowledge or by the wider dissemination of information. In this connection it may be observed that, though praise has often been promised to the man who could make two blades of grass grow where one grew before, yet if we are looking to the civilization of the world and not to a mere increase in the population, it would be better to confine our promised praise to the man who could make two blades grow at the same expenditure of labour as it originally cost to produce one. If a similar report to the Agricultural Output of Great Britain Report of 1906 (Cd. 6277) had been made in many previous years, instead of its being the first of its kind, it would have been possible to correlate the increased use of mechanical motive power, &c., with the decrease in agricultural population. A second possible method of effecting the facility with which food could be procured would be by producing changes in the total numbers of the people. A permanent increase in the population of any enclosed area is normally accompanied by some increase in the amount of food produced within that area; and we have to ask ourselves whether the additional population would obtain this additional food with the same facility as heretofore. Similarly in the case of a decrease in numbers, the question is whether the diminished population would find it easier or harder to obtain the necessaries of life. Or generally, would a change in the density of the population affect the surplus of time available for the maintenance of all the influences now promoting our civilization? An increase in the population might make it necessary to cultivate some land poorer than any of that previously cultivated, in which case any new-comers would be fed with greater difficulty than any part of the previously existing population. On the other hand, it might be that these added hands would be so employed that the average food supply of the whole nation would be facilitated by their presence, and that this increase in numbers would, therefore, in itself produce a beneficial effect on the average civilization of the people. What would be the actual effect of an increase or decrease in numbers on the facility of food supply in any particular area cannot as a rule be predicted with any degree of certainty, one of the difficulties of such a forecast being the necessity of leaving out of account any concurrent material improvements due to other causes that might be in progress. It is at all events not illogical to hold the belief that any further increase in the population of some countries, India for example, would in itself add materially to the sufferings of the people and check their progress, whilst in other localities, Canada for example, an increase in numbers might aid in the opening up of the whole country and have a beneficial rather than a harmful effect on its civilization. These two methods of facilitating food supply need not, however, here be further discussed, as they lie somewhat outside the scope of our inquiry.

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[15] "Recent Development of German Agriculture." Cd.-8305, 1916, p. 6.

In considering the effects of an increase in the numbers in any area, we have, however, also to ask ourselves whether the increment to the population would be, on the average, as efficient as the previously existing population; that is to say, whether they would individually produce their food as easily as the original inhabitants, granted no change in the methods of agriculture or in other material conditions. We have seen that it is very improbable that any natural increment to the population would be an average sample of the whole nation, and this leads us to consider the third method of facilitating food supply, namely by increasing the natural efficiency of the human machine, a method nearly always overlooked. What we want to know in the first place is the extent to which individuals differ from each other in their natural capacities for the production of goods of various kinds; for the effect of racial progress might be to increase the proportion of those who are able to do their work rapidly and with little fatigue. For this purpose a statistical study of piece-work payments should be made where the conditions are such that the output of individuals is not artificially limited. Women's work in war time on such goods, for example, as gas masks would be an especially valuable field for such an investigation; for the patriotism aroused in these circumstances would be a factor tending to overcome the influences in favour of uniformity of output. Facts thus gathered would be of some assistance in forming a judgment of the possible effects of racial progress in regard to agricultural and industrial output. Perhaps quite as important as a rise in the qualities of the rank and file might be an increase in the numbers of the captains of industry, or of those who introduce improvements in industrial methods; but here we seem to pass beyond the possibilities of statistical investigation.

It would also be of great importance if we could in some way measure the enormous volume of wholly unprofitable labour caused by the presence of the unfit in our ranks, or ascertain to what extent our available surplus of energy is being uselessly expended because of the definite defectiveness of a proportion of the population. As to the unproductive State-expenditure thus incurred, it is difficult to give even a vague indication of the amount, amongst other reasons because of the chaotic state of our Government statistics. For example, in an important memorial urging the Government to supply a complete Parliamentary return of expenditure on public assistance, it was stated that the total *tax* expenditure under this heading in England and Wales is now estimated at not less than 70,000,000*l*. a year, whilst no estimate could be formed as to the similar expenditure out of *rates*. This return, which is known as the Drage return, and which will be forthcoming after the war, would include expenditure on relief of the poor, on unemployment, on certain hospitals, on the provision of meals in schools and other items, most of which would increase with racial deterioration.[16] In 1913 I myself endeavoured with but poor success to extract the items of public expenditure which would be considerably reduced by successful eugenic reform. It was possible to ascertain that the *tax* expenditure in the United Kingdom on law, justice, police, relief of the poor and lunatic asylums amounted to about 48,000,000*l*. a year; but no estimate could be made of the expenditure out of rates on these items. It was also estimated that the total contributions by employer, employed and the State for National Insurance amounted to some 25,000,000*l.* a year; a sum which would obviously be reduced in future, or the benefits increased, if the race were to become endowed with better constitutions. The expenditure on special schools for defective children is an item which could not then be ascertained. Other public burdens besides taxation must not be overlooked in this connection; as, for instance, compulsory military service, which falls harder on those capable of bearing arms in proportion to the numbers found to be incapable. Turning to private expenditure, the incomes of endowed charities were then estimated at 3,500,000*l.* a year, whilst the statement that this sum might be increased to 10,000,000*l.* if unendowed charities were added was little better than guesswork; and as to the enormous cost of maintaining the sick and defective in private homes and institutions, not even a guess could be formed as to the amounts involved. Then, again, as to the nation's drink bill, at that date estimated at 160,000,000*l.* a year, many of us are no doubt disposed to think that we here see great possibilities of money being devoted to higher ends by higher types. There are also many obscure ways in which the unfit injure the fit; for many duties which the unfit fail to perform must be performed by the fit without remuneration, and the bad debts of the wastrel often fall as an unperceived burden on his neighbour's shoulders. Lastly, wages are closely correlated with the average value of the work done, and a fall in real wages would, therefore, be the inevitable result of racial deterioration. The foregoing facts have at all events been sufficient to convince me that racial and economic progress are closely correlated, and they have made me earnestly desire that some trained statistician would do what is possible to explore this almost unexplored field.

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[16] In regard to Drage Return see *Times*, July 25, 1918.

As a justification for great efforts to lower the rate of multiplication of the less fit, these considerations will perhaps be felt to be conclusive by many who yet urge that the evils resulting from over population are so serious that as regards no section of the community should an increase in numbers ever be demanded. A reduction in the size of the families of the poorest classes no doubt cannot be too insistently advocated; but there are many reasons why there should also be a simultaneous propaganda in favour of an increase in the rate of multiplication of the fit. In the first place the advocacy of a decrease in the sizes of families, if it were indiscriminate, would be less likely to be successful amongst the thoughtless and undesirable types than amongst careful and farseeing citizens, thus doing racial harm. If we were to accompany such a propaganda by the mere expression of a hope that the fit, though not increasing, would not decrease in numbers, our appeal would be so vague and impractical that it would have no appreciable effect as a racial safeguard. It should, moreover, be remembered by the advocates of indiscriminate birth control that an advocacy amongst the well-to-do of an increase in the sizes of their families not sufficient to prevent them from being self-supporting would not necessarily in itself produce any harmful economic results. Any increase in the price of goods of all kinds consequent on an increase in the self-supporting part of the population would at once put on the brake by increasing the number of families where the desire to maintain their existing level of civilization would make further progeny seem to be undesirable. Then, again, the ultimate injury to the world which would result from a relative decrease in the numbers of the white races in comparison with other inferior stocks must be held in view; for even if the necessary overflow from Europe were to cause suffering elsewhere for a time, yet the total suffering of mankind might thus in the end be greatly diminished. All these considerations have to be weighed in the balance when considering the demand that no measures designed to increase the fertility of self-supporting families should meet with our approval, because of their possible effect of unintentionally increasing the numbers of those incapable of supporting themselves in comfort; and when it is remembered that many of the evils of over-population, though grievous, might be but temporary in a cosmic sense, whilst racial progress through the agency of heredity would act beneficially on the countless millions of the unborn in the long ages to come, surely we ought to have no hesitation in advocating with all our might an increase within reasonable limits in the size of the families of all honest, healthy and completely self-supporting citizens.

The conclusions here arrived at may be summarized as follows:—The main aim of the eugenist should be to make the sizes of families proportionate to the innate worth of their members. Advancing civilization is normally accompanied by a relative increase in the wealth and culture of the more fit, and it thus unfortunately produces an increasing tendency for families to be large where they should be small and to be small where they should be large. The effects resulting from those differences in the birth-rate which are associated with differences in wealth are, moreover, likely to become more harmful as time goes on; because the wages earned are likely in future to give an increasingly reliable indication of innate worth. If racial deterioration is to be avoided the State should be given the right to prohibit the multiplication of the grossly unfit, and until this right is generally admitted, proper precautions in regard to the future of the nation cannot be taken or even properly discussed. The segregation or placing under proper and kindly control of the feeble in mind is but a single step in the right direction, a step we are now beginning to take in a faltering manner. Voluntary limitation of the size of the families of the unfit, though it should be advocated as possibly having great beneficial effects, would in itself be far from sufficient for the racial needs of the nation. As to the promotion of parenthood amongst the more fit, here moral forces might produce great results. Moral persuasion might also be reinforced by economic considerations, the most important aim for the reformer being to lessen the apprehension of farseeing parents in regard to the welfare of their children yet unborn. With this object in view, any assistance given to parents should be proportionate to the number of children being reared; but, it should be noted, if the ambitions of the parents were thus to be stimulated by increased hopes being held out to them of being able to push but a few of their children much higher up the social ladder, the effect on the birth-rate might be the opposite of that desired. Large rebates of income-tax should be granted in reference to the number of children in the family, the object being in effect to transfer wealth from non-parents to parents in the same social group. If the dangers of racial deterioration consequent on the fall in the birth-rate amongst the educated classes are contrasted with the immediate dangers of over-population due to the advocacy of the more rapid multiplication of the fit, it seems that an increase in the fertility of the fit should be vigorously demanded; whilst a decrease in the fertility of the unfit is to be advocated strongly on both racial and immediate social grounds. A vast field of inquiry is here open to all who would strive for the future greatness of our country. Many of the points raised are highly controversial, and in regard to every one of them statistical inquiries might help to solve the problems involved.

DISCUSSION ON MAJOR DARWIN'S PAPER.

DR. DAVID HERON, in moving a vote of thanks to the author, said it gave him great pleasure to move that the thanks of the Society be accorded to Major Darwin for his most interesting and instructive Paper. He thought Major Darwin was fortunate in the moment he had chosen to direct their thoughts to the problems of national eugenics, for the atmosphere of reconstruction could not be otherwise than favourable to that branch of applied science. Turning to the Paper itself, he ventured to think that Major Darwin's statement in regard to the eugenic effect of the death-rate might possibly give rise to some misconception. He was of course in full agreement with him when he said that to promote racial progress by a differential murder system was entirely out of the question. National eugenics denied to no one the right to live. It did say that there were some children who were better not born. It must not be forgotten, however, that the selective death-rate remained and would remain a most potent factor in racial progress. Professor Karl Pearson had given a very interesting illustration of its effect from his studies of Quaker families. He examined the age at death of parent and child, and found that when the parents died young, then the death-rate of the children was extremely high; while on the other hand, when the parents lived to old age, the death-rate of the children was very much smaller. To take a concrete case, while only 33 per cent. of the daughters of mothers who died under 40 reached the age of 21, no less than 70 per cent. of the daughters of mothers who lived to the age of 70 reached the age of 21. That gave the clearest possible proof of the importance of the selective death-rate. As regarded the future eugenic action, most of them would agree with Major Darwin in thinking that it was only the birth-rate which could be influenced, but even there they were bound to confess that their powers were extremely limited. Something was being done, and more could be done by the segregation or partial segregation of the mentally defective, the insane, and the inebriate, but he doubted whether public opinion would sanction a sterilisation of any group of individuals however obviously unfit they might be, at least in the near future. The encouragement of the fertility of the more fit was a more promising field, and they could at least press for the removal of all handicaps of parentage. The present allowance to parents in respect of income tax was far too small to have any real effect. In the case of earned incomes not exceeding 500*l*., for instance, they only amounted to 2*l*. 16*s*. 3*d*. per child per annum, which was increased to 3*l*. 15*s*. in the case of incomes between 500*l*. and 800*l*., and decreased again in the case of incomes between 800*l*. and 1,000*l*. by the refusal to make any allowance in respect of the first two children. Major Darwin's suggestion that money should be transferred within each economic group from the childless to those with children was a most valuable one, and a comparatively simple method of carrying that into effect would be to add one-fifth to the taxable income of the childless. The present allowances in respect of children resulted in a loss of revenue of approximately 7,000,000*l*. in the financial year 1916–17 out of a total income tax revenue of over 200,000,000*l*.; and any increase in those allowances should certainly be compensated for by increased taxation of the childless. It was perhaps hardly necessary to ask there for further statistical research on those problems, but he would again press for the establishment of a special section of the Registrar-General's Department, whose function would be to prepare special reports on the factors influencing the birth, marriage, and death-rates of various sections of the community. The establishment of a Ministry of Public Health in the near future emphasized the need for such special investigations, the majority of which were really beyond the powers of the private research worker. They all recognized how much had been done by the present Registrar-General and by Dr. Stevenson in that direction, and he especially looked forward to the completion of their studies of fertility in relation to occupation and housing. Volume 13 of the Census was so very interesting that he only hoped the concluding volume on that subject would now soon appear. He thought they could rely on them to take every possible advantage of the opportunity which would be offered by the next census to obtain the maximum amount of information in regard to those problems and to publish their analysis of the information so obtained with the least possible delay.

Sir J. ATHELSTANE BAINES, in seconding the vote of thanks, said, that this was a duty which he could perform with the greatest pleasure, though he felt himself unqualified to enter into the discussion. The Paper showed all the thought and thoroughness which Major Darwin put into all the work he had done in such varied spheres as the House of Commons, the Royal Geographical Society, and now, in his latest field, the study of eugenics. They were all extremely thankful to him for coming forward again with a paper on this subject, even though, as the author had himself admitted, he had not provided as many figures as was customary here. The reason for this omission was no doubt the fact that the subject had not yet been handled by any considerable number of statisticians, for lack of material. A few competent specialists had devoted a great deal of attention to it, and, as Dr. Heron had observed, there were branches of statistics which had still to be developed before they would yield well-founded conclusions upon many of the questions referred to in the Paper. In reading, though not studying, some of the papers about eugenics published within the last few years, what struck him was, that the mathematical deductions connected with the questions had been drawn from, statistically speaking, a narrow field, so that the conclusions were too wide for the comparatively small number of facts on which they rested. He recognized that the modern mathematical treatment of small numbers was immeasurably better than that current when he was a student, still, bricks, even now, needed a good deal of straw to make them sound. As regards the second of his functions, that of continuing the discussion, he would only state that he was unable to appreciate, on a single hearing, a paper so remarkably comprehensive, and raising many different issues, which had to be focused in one's mind before they could be discussed. He was glad that there were some present more familiar with these points. On one matter which had interested him he hoped the Registrar-General might throw some light, and this was the relations between the mortality during the first year of life and that of the four succeeding years respectively. Was a high infantile mortality the weeding-out of the weakly, and thus conducive to the survival of the physically fittest, or not? The correlation of the statistics of means, prices and other factors, with the marriage and birth-rates, a very relevant enterprise, had been for a good many years a favourite topic of Mr. Yule, and it was to be hoped that he would bring up to date the valuable tables he had at different times elaborated, especially as the close analysis of the abnormal features of the four last years might help towards our knowledge of the conditions in normal times, the extremes tending to throw light upon the means. The Paper was founded upon averages, and unless a very wide view was taken of the information available, they would not get much further. He heartily endorsed the vote of thanks to Major Darwin, and he thought the Society had been very lucky in having been able, through his assistance, to open the Session with so good a Paper upon so interesting a subject.

Captain CUNINGHAME said that it was inevitable that a discussion on this subject must give rise to a good deal of controversy, and he regretted to say that he thought Major Darwin had confined himself to rather a superficial study of the question, that is, only to the material aspect of life. The speaker then referred to a letter he had written some years ago to a correspondent who had written to "The Times" on the subject, in which he had expressed the view that the Eugenic Congress lately held, had passed by the practical difficulty of defining who were fit and who were unfit. He submitted that the most drastic measures would utterly fail to remedy the evil. Often the most eugenically fit couple were childless, as they had, no doubt, all observed; and it showed that there was a Higher power in Nature controlling merely mechanical operations. The problem which eugenists had to face was not the care of the unfit, *but the instruction of the fit*—how to regulate the intercourse of the sexes so that life should yield its best in every respect. Observation establishes the fact that, with comparatively few exceptions, married people do not attain a great age, the majority dying under 70. It was painfully noticeable that many married men never reached middle life, or if they reached it, did not emerge from it, except perhaps as hopeless cripples. He further referred to the lack of instruction to young people about to enter the married state. The tacit assumption was that now they might indulge themselves *ad libitum*—a practice inconsistent with any conceivable theory of the conservation of energy, and sufficient to account for all the ills that so sorely perplex social reformers in these days.

Professor MACBRIDE said he was one of the few professional biologists in the room, and he would like to express his admiration for Major Darwin's Paper and to say that, so far as he was acquainted with the studies which had been made on the subject of heredity—and he knew all the important investigations that had been done in the last twenty or thirty years—Major Darwin's conclusions were absolutely sound. He felt that if Major Darwin suffered from anything, it was from over-caution. It seemed to him that the progress of the English race depended upon the recovery of the old habits of independence and thrift; and nothing could be more enervating, more relaxing in the development of all fine qualities, than the attempt to encourage by State doles the production of families by those who fell to the base of the social structure and were, as every one practically acquainted with the thing knew, the least fit mentally and bodily; such attempts imposed a perpetual burden on those progressive members who made for the advancement of the race. It might be that they were a long way from enforcing the rule that every one should support his own children, which was the only sound rule, and that if a man brought children into the world whom he could not support, he should be sterilised. At the present time, if a man and a woman went to the workhouse because they could no longer support themselves and their children, they were forbidden (at least until quite recently) to have further opportunities of propagation. That was a sound rule and might be regarded as temporary sterilization: what was wanted was an extension of it. There was very little doubt on this, that if they went on with the sort of sickly sentimentalism which was rampant at the present time, another nation which was most likely to be their greatest economic rival in a very serious sense, namely, America, would beat them in the race for commercial supremacy. In America, public opinion had no doubt whatever on the subject that the man who improved his position and got on, no matter to what social position he belonged, was a fit man, and the idea of placing a heavy tax on those people in order to support the wastrels, would be scouted by all intelligent American politicians. Eugenics in America had gone further than they had in England, as he regretted to have to admit. In their eugenic records the American workers had established the history of the descendants of a number of wastrels and criminals in various States dating back one hundred years; and he did not think that the appalling curse of the progeny of those people had been realised by anyone who had not examined those records. They showed that the subject of human heredity was one of prime importance for the future of the State.

Dr. SALEEBY said that, in view of what Major Darwin had said about the effects of inherited wealth, he wished to ask whether it was not rather difficult to resist the proposition that along with (1) and (2), there should be added (3), either the abolition or the very drastic curtailment of the inheritance of wealth. That was a proposition put down on eugenic grounds by Dr. Alfred Russel Wallace. He also asked whether the logical conclusion from No. (2), that the size of the family should bear a close relationship to the wages or the salary earned, did not seem to lead them in the direction which Professor MacBride would doubtless scout very vigorously, of a national endowment of childhood. He further wished to suggest, as was hinted by the last speaker but one, that the real number of racially unfit, the genetically unfit, was vastly smaller than practically all eugenists assumed for the reason that practically all eugenists, following Francis Galton himself, persistently ignored the action of what he called the racial poisons. There was no allusion in the paper to the racial poisons, or to the fact that syphilis, for instance, could ruin the qualities of what might have been the finest stock in the world ; nor to the similar action of alcohol. He suggested that if they made sufficient syphilological studies, to mention no others, they would discover that the real number of the racially unfit—those who came of genetic stock which was inherently inferior, had been immensely overstated by the eugenists, because they, following the tradition of their great master, Francis Galton, for the most part had totally ignored that factor. Lastly, could they afford to wait till the next census in 1921 ? Did not they want what their Chairman wanted ?

Dr. Brownlee said that Major Darwin's Paper raised questions which he thought eugenists were too apt to forget. If they took the censuses of England and Wales for 1901 and for 1911 it would be found that the increase in the population at ages under 25 years was only 3·8 per cent. which allowed on an average only 26,000 people a year for increase of the population or for emigration. The population figures as usually published showed an increase of 11 per cent. in the ten years, but this is quite misleading, as the great bulk of the increase is among persons over 25 years. He thought that whatever the ultimate effect of eugenist propaganda might be they would certainly result in the first place in lessening the birthrate which, as the figures showed, was already reaching a dangerously low level.

The Chairman said, before putting the vote of thanks to the meeting, he wished to express on their behalf their grateful thanks to Major Darwin for coming forward at about ten days' notice and reading his Paper that evening, which had got them out of a serious difficulty. Personally, he had been much interested, as Registrar-General, in the suggestions which had been made by Doctor Heron and one or two there about the next census. He need only say that before the time came to plan it, he was sure his office would be only too glad to consult with Doctor Heron and anyone else who could give them help.

A vote of thanks to the author was put to the meeting and carried unanimously.

Major Darwin in reply said that Doctor Heron had spoken about the admirable work done by their Chairman as Registrar-General, and he hoped that the Royal Statistical Society and other Societies would give their support to him when pressing forward the reforms he advocated. Sir Athelstane Baines had spoken of the small number of examples on which the science of eugenics was founded. It was, he thought, rather larger than Sir Athelstane made out; but to whatever extent that was true, he hoped that further enquiries would be made. That was the best answer he could make to this criticism. If he remembered rightly, Professor MacBride said he thought he was not sufficiently bold in one or two respects. One had to be very careful in those matters not to go far beyond public opinion, keeping well up to it and perhaps even a little beyond it. If pressing too far in advance, prejudices would be created, and this would do more harm than good. He had before now broken a lance with Doctor Saleeby on the question of racial poisons, and he had no doubt they would break a friendly lance again in the future. They differed no doubt in certain respects, but not quite so much as might appear from the remarks made this evening. He thought those racial poisons were of enormous importance with regard to the next generation; but whether they produced any actual effect on subsequent generations seemed to him as yet unproved. As to whether he would be in favour of the abolition of inherited wealth, all those eugenic questions had to be considered with reference to the immediate effects produced; and one had to consider what would be the immediate effects of the abolition of all inherited wealth. That opened out rather a large subject which he would not touch upon that evening. They could only move in that direction to a limited extent. Doctor Brownlee had said it would be impossible to advocate birth control widely without producing a fall in population. He thought that was one of the reasons for pressing very strongly for an increase in the families of the more fit, so as to make up for this diminution in numbers. He himself would, however, sacrifice numbers for the sake of quality without the slightest hesitation, and he believed that it would be in every way better in the long run.

The following Candidates were elected Fellows of the Society:—

Richard T. Bartley.
Dasarathi Bhattacharjya, B.A.
Frank Charlton.
Sir Francis Dent.
Ernest C. Farmer.
Hon. Cecil Claude Farrer.
Alec Sandy Firth.
Arnold Frobisher.
Thomas G. Gibson.
Ernest Radford G. Green.
Douglas Macmillan, M.I.H.
Vyvyan James Mitchell.
Amritalal Mitra, B.A.
George Perry-Lewis.
Charles Reed.
Bertrand Roberts.
Slavko Secèrov, D.Ph.
Shoa Shane Shang, M.A.
Albert E. Wenn.

NOTES ON THE BIOLOGY OF A LIFE-TABLE.

By JOHN BROWNLEE, M.D., D.Sc.,
Director of Statistics, Medical Research Committee.

[Read before the Royal Statistical Society, December 17, 1918,
Sir BERNARD MALLET, K.C.B., in the Chair.]

A.—*Introduction.*

IN this communication I propose to discuss the results of an investigation into the graduation of a life-table. It does not apply to the whole life-table, but only to a part, the part selected for consideration referring to the ages above 10 years. Though the graduation is probably no better than and possibly inferior to those offered by the practising actuary, it is based upon a different principle. and apart from this the formula used for graduation permits of a comparison of different life-tables both in time and place in a manner which I do not think has hitherto been proposed. On account of the immense amount of arithmetic involved the investigation has been limited to male lives. It may be stated that though this is the case, comparative tests applied to the data regarding female lives have been made without discovering any discrepancy.

The discussion as developed is purely tentative, and if at times the statements are more dogmatic than is to be expected in tentative work, this method of presentation has been adopted to save the constant introduction of such phrases as "it seems to me," "it is probable," or "it is possible," which, when frequently repeated, are irritating to read and apt to obscure the argument.

Life is a very complex phenomenon, but a phenomenon which is subject to very definite laws of sequence. First, there is birth. Associated with this there is a very high death-rate in part due to prematurity, but in part also to the actual shock of birth, many apparently healthy children dying at this stage without any obvious explanation. Further, in the first week of life the mortality is at the rate of 4,000 per 1,000 per annum, which means that if this mortality acted uniformly all those born would die in the first three months. The mortality, however, rapidly declines, becoming less and less as the years of childhood pass and reaching a minimum value in males somewhere about the age of 12 years. That this mortality is associated to some extent with growth seems undoubted.

In the early months of life growth is very rapid and there must be some instability associated with this. As the rate of growth decreases the mortality likewise decreases, although the two have not been placed in any exact arithmetical relationship. The mortality during the first twelve years of life must be looked upon as dependent chiefly on two factors, a mortality due to diseases of infancy proper and a mortality due to the diseases of childhood. The former mortality decreases constantly from birth with increasing age, the latter increases from birth to a maximum and then declines. Both depend on a complex of diseases which can be roughly separated, though a more or less indefinite borderland exists between them.

From the age of 12 years the mortality again increases. The main part in this increase of the death-rate is due to senescence, and as life advances this becomes more and more the predominant factor. Probably after the age of 30 years this factor is the most important and determines the death-rates from that age to the end of life. But between 12 and 30 a second factor intervenes. A marked impulse to growth begins in males about the age of 13 to 14 years, and during the next five or six years the change from youth to manhood is accomplished. Not only does the completion of physical growth take place during this period, but the changes associated with sexual development proceed more or less concurrently. It is highly probable that this changing condition plays a part in increasing the mortality. It is wholly in accordance with biological observation that such a period should be associated with a certain instability.

Though the processes in life cannot therefore be said to be homogeneous after the age of 10 years, I have chosen for practical convenience to graduate from this epoch in spite of the obvious objections to this, that part of the mortality at 10 years of age is undoubtedly due to the last action of what are truly the diseases of childhood, and that part of the mortality also between 15 and 30 years of age is due to growth and sex development. Yet, although the process may only be held to be satisfactory from the age of 30 upwards, the error introduced by graduating from 10 years of age is not great, as the death-rates between 10 and 30 are small, and even considerable variations have little total effect on the averages as found calculated in a life table.

While it is in the highest degree probable that in the life of man, and indeed of most of the higher animals, there are regular laws describing on the average the process of growth, development, and decay, the actual problem is not so simple. If a population could be obtained in which the same diseases were present in the same amount year by year, and if the births were regularly equal to the deaths it might be possible, possessing statistics of such a community for a series of years, to deduce direct conclusions. But the conditions under which statistics can be collected never have presented such favourable features. Thus environment varies from time to time according to the zeal of the administrator, and during the present generation there has been on the whole an immense improvement in environment. Persons born in one environment have lived their lives in constantly changing circumstances and consequently the data collected do not necessarily describe the effect of the conditions present at the epoch of collection, but the sum of the effects of a changing complex.

In addition to this other circumstances interfere with the utility of the statistics as a means of discovery. One of these is the presence of epidemics foreign to the locality. Thus in the early part of last century great epidemics of cholera occurred in this country and the deaths due to this cause were sufficient to modify the life-tables constructed. Other diseases producing a considerable mortality have also more or less disappeared. Thus typhus fever is almost extinct and phthisis among young persons, so common in the middle of last century, is now a much less frequent cause of death. The influence of these factors must modify to a considerable extent the value of the data as a means of determining fundamental principles. It is found, however, that great as are the influences mentioned, the fundamental forces of life are not so much interfered with by such catastrophes as might be expected.

A second circumstance provides a critical method of measuring the relative importance of epidemics. At any epoch the nature of the environment in which populations live in different parts of the country is very different and the differences observed between the life processes in different environments furnish data of great importance. Thus persons living in the country live a very different life from persons living in a town, the effects being such that the difference between the expectation at birth in a city like Manchester and that in the healthy districts of England is sixteen years. Much greater changes are thus produced by environment than by the accidental introduction of epidemic disease.

In this connection it is important to note that the manner in which persons living at different ages respond to different environments is not arbitrary. This was long ago shown by Dr. Farr, and the matter has lately been discussed by Dr. Stevenson and myself. It is found that under one month of age there is little difference in the death-rate of those born in healthy and unhealthy surroundings, the infantile death-rate under one month in the urban counties for the years 1906–11 being on the average 42·2 and in the rural counties 38·3, a difference of little more than 10 per cent. This difference continually increases until the age of two years is reached, when the death-rate in an unhealthy locality such as Salford may be two or three times that found in the country as a whole. From this point a decrease in the effect of unhealthy environment is observed. At the age of 10 there is little difference, the death-rate in the unhealthiest surroundings being but 50 per cent. greater than that of the healthiest. From this point the difference increases, the maximum difference occurring between the ages of 40 and 50 years at which ages the death-rate in unhealthy districts is from two to three times that in the healthiest, while with the advent of old age, that is from 75 years and upwards, the death-rates again become the same. This is a constant phenomenon and must be held to represent something in the biology of life which must be taken as fundamental. It is thus of little use to take the death-rates at individual ages and to compare them. Life as a whole must be compared in each locality.

B.—*Note on methods of measurement.*

As it is by the development of methods of exact measurement that physical science has advanced to the extent it has during the past two hundred years, and it is only by the same methods that many problems in biology can be solved, it is therefore of fundamental importance to have a clear understanding of the limitations under which vital statistics at present lie owing to the absence of suitable standards. To illustrate this point briefly the case of an electric lamp may be taken. Let us suppose that a varying current passes through this lamp and that there is no means of measuring the current other than the amount of light which is produced. By means of the ordinary arrangement for estimating the amount of light the variations can be expressed in the terms of a standard candle. Were there no other means available the current then might be presumed to be proportional to the light produced. This except in a very small number of instances is the stage of measurement attained at the present moment by the biologist or the actuary. The unknown is measured largely in terms of the unknown. Physical science has however gone many stages beyond this. The strength of an electric current can be measured in many ways, for instance, by the attraction it produces on other currents, by the amount of heat generated or by the weight of silver deposited in a galvanic cell. When the strength of a current is measured in any of these ways it is found that the amount of light given off by a filament lamp is not directly proportional to the current but varies according to a different law. In all branches of physical science measurement now ultimately depends on the number of units of energy and by this means a common measure of light, electricity, heat, chemical change, etc., is obtained which allows both the scientific and the practical man to direct their operations and to determine the efficiency of any process they may need to employ.

In vital statistics units are dealt with concerning each of which it is impossible to make any prediction. The truth only appears when large averages are taken. The branches of physical science to which vital statistics are most closely allied are the theory of molecular motion of gases and the allied problems in physical chemistry. In these sciences no attempt is made to consider any individual molecule. The number of molecules, however, in any finite unit of space at any instant is so great that it is possible to predict the phenomena expected in these sciences from the theory, and by experimental test verify, without much doubt, that substantial agreement between the theory and the experiment exists. The problem in vital statistics is to find some equivalent means of estimating the average vitality of the unit comparable to the amount of energy in the molecule. If this can be found it should then be possible to correlate the different manifestations of life with some common term into which every other measure can be converted. To this end up to the present very few attempts have been made, though in the region of biological chemistry the field has not been so barren. A brief summary of the state of knowledge may perhaps be interesting. The pioneer in this matter is Dr. Farr. In his decennial supplement for the decade 1861–70 he suggested a very close relationship between the number of persons livng per acre and the death-rate among these persons. Though this relationship called Farr's law has fallen into the background it can be fully justified, as will be shown later. The form of the law, which is that the death-rate varies as a power of the density, appears empirical and is undoubtedly so, but a considerable number of other vital phenomena can be described by the same formula. For instance, in racing the relationship between the record time for any definite length and the length comes under the same form. Not only is this so but the arithmetical value of the power is found to be identical even when the data relating to horses and man are examined for such different events as trotting, running, swimming, etc. The formula also describes the degree of inhibition of the rate of the action of numerous organic and inorganic ferments when poisons in varying strength are added to the media in which the reaction is taking place. Other relationships equally marked are also known. Thus there is a quite definite relationship between the amount of diphtheria toxin administered experimentally to animals and the rapidity of death or the degree of emaciation produced. Also when scarlet fever is spread by milk the numbers infected depend in a definite manner on the amount of milk drunk. From this summary it is quite evident that vital statistics as a quantitative science is in its infancy, and that much experiment and extensive collections of data will be required before any adequate treatment of the subject can be hoped for.

C.—*Measurements of vitality in use.*

The chief measurements of vitality which are, or have been, in common use, or are proposed for use, are as follows :—

(1) The death-rate per thousand per annum : -This is obtained by multiplying the number of deaths which occur in any year by 1,000 and taking the ratio of this number to the number of the total population. This is now recognised to be a very inaccurate method of comparison, as the population in different districts varies greatly in age and sex constitution.

(2) The standard death-rate :—This is calculated by taking the death-rates per thousand at each age-period in each sex for any definite place and applying these severally to the corresponding group in a population of definite age constitution. This affords a measure of comparison which may be taken as on the whole quite accurate. The drawback to it is that the standard populations in common use are populations in which the number of births has been constantly greater than the number of deaths and consequently the number of persons living at high ages therefore is too small in comparison with the number living at lower ages. In consequence the death-rates in healthy districts are too low in comparison with the death-rates in unhealthy districts.

(3) The life-table death-rate :—This death-rate is the death-rate of the whole population as obtained from a life-table. In the life-table the populations at each age are so adjusted that the number of births exactly balances the number of deaths. There is thus no excess of numbers at any age, so that the figure may express something which has a real relation to the ultimate measure. This death-rate is undoubtedly the best measure that has hitherto been proposed. The difficulty has been that the construction of a life-table is laborious and in consequence the measure has been little used. This difficulty, however, has been overcome (formula 3 *inf.*).

(4) I have proposed to make an extension of this measure. A life-table death-rate may be taken at any age and in that case signifies the ratio between the number of deaths occurring above the specified age and the number of persons living above that age. This death-rate is obviously the reciprocal of the expectation, and, as it will be seen, furnishes an empirical relationship which can be used to extend our knowledge of vital processes.

(5) Comparisons have also been made between the death-rate at different ages in different places.

(6) The expectation of life:—This is commonly given in life-tables. It is true that it is of little use to the actuary, because his problem is complicated by the introduction of the rate of interest. I hope, however, to show that this measure is of considerable importance from the point of view of the biologist.

(7) In a life-table the chance of living one or more years is given as a measure of the vitality at each age or, what amounts to the same thing, the chance of dying in one or more years.

(8) In a standard population with a constant number of births it is also possible to take the number of deaths occurring in each year as a measure of vitality looking at the matter from the point of view that each person is born into the world with a force of vitality sufficient to carry him through so many years of life. This criterion has not been much used and Professor Pearson alone has hitherto made a careful graduation on this basis.

D.—*The life-tables employed.*

The data on which the present investigation is based are contained in the series of life-tables for England and Wales, which refers to groups of years between 1881 and 1912. All these life-tables have not been constructed by the same methods. The accuracy differs. Some, in fact, especially those in the decade 1881–90, as has been pointed out to me by Mr. Finch, do not sufficiently accord with the data to be wholly trustworthy. The life-tables used are summarised in the following description, in which the date, the author, the authority of each life-table is given, and to which, in addition, an index letter has been added so that the table can be conveniently referred to. (Table I.) The more important tables are indicated by an asterisk. Others are added because they have been used in subsidiary work, but the numbers from which they have been calculated are small, and, consequently, their value cannot be appraised as equal to that of the life-tables based on the larger populations.

Table 1.—*Life-tables used in the calculation in this Paper.*

District.	Constructed by	Issued by	Symbol.
1881–1890.			
*England and Wales	Mr. A. C. Waters	Registrar-General	E_5
*England and Wales (Healthy Districts)	,,	,,	H_1
*Manchester	,,	Medical Officer of Health.	M
Oldham	Dr. Chas. H. Tattersall.	....	O
Brighton	Sir A. Newsholme	....	B_1
1891–1900.			
*England and Wales	Mr. F. Finch	Registrar-General	E_6
*England and Wales (Healthy Districts)	,,	,,	H_2
*London	Mr. G. H. Day	Medical Officer of Health	L_1
Salford	Dr. Chas. H. Tattersall.	....	S_1
Brighton	Sir A. Newsholme and Dr. T. H. C. Stevenson.	....	B
1901–1910.			
England and Wales	George King, F.I.A.	Registrar-General	E_7
London	....	Medical Officer of Health	L_2
Salford	Dr. Chas. H. Tattersall.	....	S_2
1910–1912.			
*England and Wales	George King, F.I.A.	Registrar-General	E_8
*London	,,	,,	L_3
*County Boroughs	,,	,,	C B
*Urban Districts	,,	,,	U
*Rural Districts	,,	,,	R
Other Tables.			
British Assurance Experience	Committee of the Institute of Actuaries and Faculty of Actuaries.	Institute of Actuaries and Faculty of Actuaries.	$O^{(M)}$
Manchester Unity Experience	Sir Alfred Watson	I.O.O.F. Manchester Unity	M U

E. *Mathematical notation and formulæ.*

The mathematical methods and formulæ are comparatively simple. So far as the quantities concerned are the same, the notation, with one exception, is that used by the Institute of Actuaries.

I.—*Notation.*—

x = the age estimated from birth.

l = the number of survivors at any age out of any definite number born; when a definite age is specified this is indicated by a suffix as l_{10}, l_x, &c.

$d_x = l_x - l_{x+1}$ is the number of deaths during any year of life.

E = complete expectation of life at any age: the usual notation e is not employed, as exponential curves occur largely in the formulæ.

e = curtate expectation of life: this is only used to obtain E.

μ = the death-rate at any age (the force of mortality of the actuary).

D = life-table death-rate at any age $= \frac{1}{\mathrm{E}}$: this quantity is of first importance.

Δ = standard death-rate.

δ = number of persons living per sq. mile.

II.—*Relations between the quantities*—

(1) Definitions—

$$\mu = -\frac{1}{l}\frac{dl}{dx} \qquad (1)$$

$$\mathrm{E} = \frac{\int_x^\infty l dx}{l} \qquad (2)$$

$$= \frac{\int_x^\infty (x' - x) d \times dx'}{\int_x^\infty d \times dx} \qquad (3)$$

(2) Deductions from definitions—

From (2)
$$-\frac{1}{l}\frac{dl}{dx} = \frac{1}{\mathrm{E}} + \frac{1}{\mathrm{E}}\frac{d\mathrm{E}}{dx} \qquad (4)$$

whence
$$\mu = \frac{1}{\mathrm{E}} + \frac{1}{\mathrm{E}}\frac{d\mathrm{E}}{dx} \qquad (5)$$

(3) Empirical relations—

$$\mathrm{D} = m\Delta + c \qquad (6)$$

Using the population of England for 1891–1900 as the standard population, the life-table death-rate for all ages is obtained for the standard death-rate by taking $m = \cdot 6811$ and $c = 9 \cdot 54$.

Values of m and c for other ages are published elsewhere.

$$D = \rho\delta^{q} \qquad \text{(Farr's Law)} \qquad (7)$$

(4) Interpolation formulæ—

$$\mu_x = -\frac{1}{l}\frac{dl_x}{dx} = -\frac{1}{l_x}\left\{\frac{2}{3}(l_{x+1} - l_{x-1}) - \frac{1}{12}(l_{x+2} - l_{x-2})\right\} \qquad (8)$$

and a similar formula in the terms of E can be obtained from (5)—

$$E_x = e_x + \cdot 5 - \frac{1}{12}\mu_x \qquad (9)$$

III.—*Special cases*—

(I.) $E = c$.

From (4) as $\frac{dE}{dx} = 0$

$$-\frac{1}{l}\frac{dl}{dx} = \frac{1}{c}$$

$$l = Ae^{\frac{x}{c}} \qquad (10)$$

In this case both the death-rates and the expectations are constant. If A individuals exist at the beginning of the experiment then the number living at any subsequent age is given by the formula. This is a very well-known case and has been extensively investigated experimentally. It represents the rate of death in bacteria and some higher organisms when placed in an unfavourable environment, such as a disinfecting solution. There is thus an experimental basis for the use of the constant in Makeham's hypothesis.

(II.) $\mu = -\frac{1}{l}\frac{dl}{dx} = ae^{bx}$ (Gompertz' hypothesis)

From this $l = Ae^{-\frac{a}{b}e^{bx}}$ (11)

This implies that the substances or capacities on which life depends decay according to the law of the uni-molecular reaction, that is that the amounts present at the end of equal intervals of time can be represented by the terms of a geometrical progression. This law has also an experimental basis.

(III.) $\mu = \frac{1}{l}\frac{d}{dx} = c + ae^{bx}$ (12)

(Makeham's hypothesis)

This case is the sum of the two preceding.

IV.—*Graduation formulæ used*—

(I.) $E = a(C - x)^{n}$ (13)

where C = upper limit of life and a and n are constants.

From this $$\mu = \frac{1}{a(C-x)^n} \quad \frac{n}{C-x} \tag{14}$$

$$\log_e l = \frac{1}{(n-1)a(C-x)^{n-1}} - n'\log_e (C-x) \tag{15}$$

In this formula, C, n, and log a are linearly related.

(II) $$e^{cx} = \frac{e^{a-nE}}{E} \tag{16}$$

when a, n, and c are constants.

From this $$\mu = \frac{1}{E} - \frac{c}{nE+1} \tag{17}$$

$$\log l = \log k - \left(1 - \frac{n}{c}\right) \log E - \frac{1}{cE_x} \tag{18}$$

where k is a constant chosen from the data.

V.—*Method of derivation of the formula.*—The formula used is derived in the following manner. Let p denote the amount of some substance A present at the beginning of the reaction, the substance A being changed during the reaction into a new substance C. Then let q denote the quantity of the acting ferment present at the beginning of the reaction. Let x denote the amount of A which has been transformed at the time t. Let y denote the amount of the substance A, which is combined with the ferment at the time t, this intermediate compound being denoted by M.

The rate of formation of the new substance C is then proportional to the amount of the intermediate compound, so that we have :—

$$\frac{dx}{dt} = k_1 y.$$

But since $p-x$ denotes the amount of the original substance present and $q-y$ the amount of the ferment which remains uncombined, the necessary equation of equilibrium is $(p-x)(q-y) = k_2 y$. By eliminating y from these two equations and integrating we get

$$k_1 q t = x + k_2 \log \frac{p}{p-x}.$$

As the amount of the original substance A is here taken proportional to the force of vitality at any age the quantity $p-x$ is represented in the formula given above by E and the equation assumes the form given above. Comparing the constants in the two formulæ given above we find that :—

$$c = \frac{k_1 q}{k_2}$$

$$a = \frac{p}{k_2} + \log p$$

$$n = \frac{1}{k_2}.$$

The linear relationship found between c, a and n implies therefore that the four constants occurring in the development of this equation are rigidly related. This theorem is taken from Mellor's "Chemical Statics and Dynamics," page 376. The same formula can be obtained on a more complicated set of hypotheses and it is probable that on several other hypotheses it would also result. This is an advantage, however, and not a drawback, as life is a process of extreme complexity. A formula, therefore, which can arise in an essentially similar form has for the purposes considered at present very distinct advantages.

VI.—*The method employed in fitting the data to the formula.*—The formula (16) has been fitted by taking the logarithm

$$cx = a - n\mathrm{E} - \log \mathrm{E}$$

and fitting by least squares between the ages of 10 and 85, the values being taken at intervals of five years. As the values have been calculated by taking the logarithm to the base 10 the true values of c, a, and n are to be obtained from those given in Table III by multiplying by 2·3026.

Formulæ (17) and (18) also become—

$$\mu = \frac{1}{\mathrm{E}} - \frac{c}{n\mathrm{E} + \cdot 43429} \qquad (19)$$

and
$$\log_{10} l = \log_{10} k - \left(1 - \frac{n}{c}\right) \log_{10} \mathrm{E} - \frac{(\cdot 43429)^2}{c\mathrm{E}} \qquad (20)$$

F.—*Farr's Law.*

Dr. Farr, as has already been remarked, did not content himself with merely making the observation that the environment affected the general health, but went further and tried to obtain a relationship between the death-rate and the number of persons living on a definite area. Density of population is, of course, not the whole cause of associated ill-health. In general, density of population is associated with more crime, more drunkenness, more infectious disease, more ill-feeding, &c. Further, it is immediately evident that for small areas the number of persons living on each acre has no definite relation to health. Persons may be densely packed, but if they are self-respecting and earn fair wages the general level of health may be high. Comparisons must thus be made on large averages taken throughout the country as a whole. Dr. Farr divided the country into seven areas according to the crude death-rates of the registration districts. From these figures he found that the crude death-rates could be very closely correlated with the density, the relation being of the form shown in the formula given in the preceding section. Dr. Farr's law fell into oblivion because the only death-rates available for comparison were crude death-rates, and as time went on the relationship shown to obtain for the decade 1861–70 appeared no longer to hold. Fortunately, however, Dr. Farr published the data on which his conclusions were based, and it is thus possible to rediscuss the problem. The method of obtaining a life-table death-rate from a standard death-rate [formula (6)] has permitted a recalculation of the death-rates in each of Dr. Farr's chosen areas for the decade 1861–1870. A like method has been applied to the statistics given by Dr. Tatham for the decades 1881–1890 and 1891–1900. The equations connecting the density and the death-rate found from the death-rate are respectively :—

1861–1870 ... ... $D = 12{\cdot}42\ \delta^{\cdot 10018}$
1881–1890 ... ... $D = 11{\cdot}45\ \delta^{\cdot 09856}$
1891–1900 ... ... $D = 10{\cdot}82\ \delta^{\cdot 10179}$

It will be noticed that the power of the density is uniformly the same—that is to say, that the death-rate, taking averages over large areas in England, varies as the tenth root of the density. This relationship has remained constant during the forty years. Further, it is noticed that what has altered is the value of the multiplying constant. This has fallen from 12·42 to 10·82. In other words, the efforts of sanitation have improved health all round, but have not fundamentally altered the relationships which hold between overcrowding and health. It is impossible to exaggerate the importance of a result like this. Imperfect as it may be as a description, the expression of such a relationship brings vital statistics for the first time into the range of the scientific method. Two kinds of data have been brought into relationship much in the manner in which so many equivalents in energy may be equated with so many equivalents in heat. The result attained may be compared to the motion of three planets round the sun at different distances, each obeying the law of gravity, while the increasing distance lessens the force of attraction. At the present moment it is hopeless to expect anything like that completeness of inter-measurement which is the rule now in physical science, but I think the view quite fallacious that the correlation of the processes of biology is inherently more difficult than the study of the different branches of physical science. What is necessary for a due advance is that careful and accurate research should be undertaken on something like the scale that has been the case in the physical sciences.

The more one reads Dr. Farr and the more one studies his work, the more it becomes apparent that practically all the main problems of statistical biology were open to his mind. Though often seeing through a glass darkly, his instinct was nearly unerring. It must always be to his credit that he was the first to bring a measure of health into relation with a quantity capable of independent measurement and independent of the vitality of man himself.

G.—*The graduation of a life-table.*

The results given in the previous section, which place Farr's intuition on a firm basis and which justify his prescience, lead one to regret that he was a statistical biologist born before his time, much as Gray has been said to be a poet in an unpoetical age. It follows that many of his ideas, in place of being developed by his friends and pupils, have been consigned to unmerited oblivion. The moment the law in question is examined it becomes at once apparent that no particular life-table can any longer be regarded as an isolated document referring to one time and place, but that the values of death-rates and expectations given in all life-tables must have some kind of definite relationship. Two quantities suggest graduation :—(1) The death-rates ; (2) the expectations. Historically there have been several attempts to graduate the death-rates. Gompertz chose to graduate the death-rates to a geometrical progression, but while this can be done very accurately for either the middle or end of life, the death-rates throughout cannot be represented by his formula for more than 30 or 40 years at a stretch, though within these years the accuracy is very great. This necessitates that the graduation is made in two sections, one section from the age of 15 to the age of 50, the second beginning at the latter age and extending upwards to the end of life. Makeham removed some of the difficulty by assuming that part of the death-rate was constant, and on this hypothesis good results can be obtained from about the age of 15 to the age of 85, which for practical purposes is all that is required. Both formulæ can be theoretically justified, as is shown in an earlier section. Later others have attempted to graduate on more elaborate bases, but the arithmetic of these new graduations is in general more complicated, and, in addition, the theoretical assumptions are more difficult to justify.

It remains to be discussed as to whether there may not be some reason to choose the expectation as a better measure of vitality. One drawback to choosing the expectation is that in calculating the expectation the assumption is made that every year of life is of equal value.* Thus a year of life at 20, a period during which a great amount of energy is expended, is valued at the same worth as a year of life lived at the age of 70, an age at which the transfer of energy between the intake of food and the output of work must be on a much lower level than at the earlier age. Leaving this point for later discussion, the steps taken to graduate the expectation were as follows:—

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* The word value is used in this paper in the sense defined in the sentence which follows and refers to the amount of energy expended in living a year of life.

The first search for a relationship between the expectation was made by plotting the successive values on double logarithmic paper. It was discovered at once that if a suitable upper limit to age at death were assumed and the difference between this and each actual age were taken as one co-ordinate and the corresponding expectation as the other, that from 10 to 75 years of age the points lay on a straight line. In other words the relation between age and expectation could be expressed by the formula $E = a(C-x)^n$ when C is the upper limit of life. This calculation was carried out for a large number of life-tables. The next step was to determine the relationship of a, C and n. It was found by plotting the values that the three constants n, C and $\log a$ varied in such a manner that pair by pair the points were found to lie on straight lines with very great accuracy, the correlation between each pair being greater than ·99. Each life-table was thus brought into immediate relation with the other. The correspondence may be said to be on the whole very close. The result is in complete agreement with the deductions implied if Farr's law is to be held as proved. There are, however, some great objections to this formula. In the first place the value of C, the upper limit of life, is lower the healthier the district to which the life-table refers and higher the more unhealthy. This is not an insuperable objection had the values of C been possible values, but in healthy districts they are much too low. Further, after the age of 75 the formula rapidly ceases to apply. An arithmetical objection also arises. The formula cannot be fitted to the figures by any method except by the choice of points at equal intervals. Modification of the values of the constants is also nearly impossible, as C occurs under the index n. The alignment of the different tables is thus rendered very difficult.

The fact of a relationship between all life-tables being, however, demonstrated, it remained to make other trials. Various formulæ in physical chemistry, which might be considered possibly applicable, were tried without success. On consideration of the general processes of vitality it was thought that the formula which described the destruction of certain substances by means of ferments which combine, dissociate and re-combine might probably give a good result. In origin it seems analogous to the order of vital processes, and if successful a graduation not wholly empirical might be considered to exist. The relationship is described by the formula $e^{cx} = \frac{e^{a-nE}}{E}$. The principles on which the formula is derived are given above. The formula possesses the advantage that it can be deduced in the same form on several slightly different hypothesis, all of which, however, refer to the same kind of actions. On trial it was found to describe the expectations with great accuracy from the age of 10 years to that of 95. It thus becomes possible to look upon the continuance of life as dependent on the inherent energy of certain substances in the body, an energy which is gradually being destroyed throughout life. This energy might be visualised as the result of the presence of an original definite amount of some specific substance, but it is more probable that it is represented by a specific capacity to control the vital processes, a capacity which gradually diminishes according to definite laws.

Considering the reasoning on which the formula just used is based, it can be shown that it is not necessary that each year of life at different ages should be esteemed of equal value. It is possible by the same formula to graduate the annual premiums for life insurance payable at death with an equal accuracy to that of the graduation of the actual expectations. As a year of life at 20, on the basis of a 3 per cent. rate of interest is worth four times a year of life at 70 and at 4 per cent. seven times, it is obvious that a system of graduation which graduates the expectations and the premiums equally is capable of expressing a wide range of values without making the definite assumption of equality of years of life at different ages, which seems to be applied in a scheme which takes the expectations as the measure of vitality. The ratio of the value of a year's life at 20 to a year of life at 70 matters little if the rate of decadence is described by the terms of a geometrical progression. The expectation as a test of vitality is thus freed from one of its chief objections from the biological and from the actuarial point of view. As a further test it may be remarked that on the reasoning on which it is derived the formula should not graduate the values of annuities. On trial this is found to be the case, the fitting bearing no relation to the values on which it is calculated.

The results of fitting the formula to the values (Table II) of the expectations are shown in the accompanying table. It will be noticed that in the twelve tables of which a synopsis is given, there is little difference of moment at any point between the theoretical and actual results. At the age of 15 years for instance, where the expectation ranges from 40 years and upwards in no case does the

TABLE II.—*Showing the Life Table and the Theoretical Expectations for certain Life Tables. The positive sign indicates that the Life Table Value is higher than the Theoretical, and the negative sign the opposite.*

Age.	1881–90.									1891–1900.								
	E₅			H₁			M			E₆			H₂			L₁		
		Actual.	Theoretical.		Actual.	Theoretical.		Actual.	Theoretical.		Actual.	Theoretical.		Actual.	Theoretical.		Actual.	Theoretical.
10	+	49·00	48·67	+	53·07	51·03	+	42·75	42·74	+	49·63	49·52	−	54·16	54·32	+	47·84	47·60
15	−	44·47	44·50	−	48·62	48·80	+	38·78	38·62	−	45·21	45·28	−	49·67	49·92	+	43·40	43·32
20	−	40·27	40·50	−	44·41	44·62	−	34·62	34·69	−	41·02	41·11	−	45·37	45·50	−	39·13	39·16
25	−	36·28	36·60	−	40·39	40·52	−	30·69	30·89	−	37·01	37·04		41·32	41·32	−	34·96	35·12
30	−	32·52	32·67	+	36·52	36·49	−	27·08	27·24	−	33·07	33·09	+	37·32	37·12	−	30·94	31·22
35	−	28·91	28·94	+	32·70	32·54	−	23·76	23·83	−	29·24	29·29	+	33·32	33·06	−	27·25	27·47
40	+	25·42	25·34	+	28·92	28·70	+	20·68	20·61	+	25·64	25·61	+	29·37	29·08	−	23·87	23·92
45	+	22·06	21·91	+	25·19	24·95	+	17·80	17·62	+	22·20	22·10	+	25·49	25·24	+	20·65	20·58
50	+	18·82	18·66	+	21·53	21·29	+	15·06	14·86	+	18·90	18·80	+	21·74	21·55	+	17·60	17·46
55	+	15·74	15·61	+	18·00	17·93	+	12·49	12·32	+	15·79	15·72	+	18·12	18·06	+	14·76	14·60
60	+	12·88	12·80	−	14·66	14·71	−	10·16	10·17	+	12·93	12·90	−	14·72	14·79	+	12·14	12·00
65	+	10·31	10·28	−	11·60	11·73	−	8·15	8·26	−	10·34	10·37	−	11·61	11·79	+	9·76	9·69
70	−	8·04	8·05	−	8·88	9·04	−	6·48	6·58	−	8·05	8·14	−	8·84	9·09	−	7·66	7·70
75	−	6·10	6·15	−	6·56	6·69	−	5·11	5·18	−	6·15	6·22	−	6·56	6·75	−	5·91	6·00
80	−	4·52	4·57	−	4·70	4·74	−	4·02	4·03	−	4·62	4·65	−	4·78	4·82	−	4·53	4·59
85	−	3·29	3·30	+	3·30	3·20	+	3·16	3·10	+	3·45	3·40	+	3·45	3·32	+	3·48	3·46
90	+	2·37	2·34	+	2·31	2·09	+	2·48	2·37	+	2·58	2·44	+	2·50	2·23	+	2·69	2·58

TABLE II.—*Showing the Life Table and the Theoretical Expectations for certain Life Tables—continued.*

Age.	1901–10.			1910–12.														
	E$_7$			E$_8$			L$_3$			C.B.			U.			R.		
		Actual.	Theoretical.		Actual.	Theoretical.		Actual.	Theoretical.		Actual.	Theoretical.		Actual.	Theoretical.		Actual.	Theoretical.
10	−	51·81	52·30	−	53·08	53·32		—	—		—	—		—	—		—	—
15	+	47·31	47·30	−	48·57	48·74	−	46·74	46·77	−	46·28	46·51	−	49·01	49·34	−	51·45	51·74
20	−	43·01	43·21	−	44·21	44·26	+	42·35	42·33	−	41·99	42·02	−	44·71	44·75	−	47·08	47·21
25	−	38·86	38·87	+	40·00	39·89	+	38·06	38·03	−	37·80	37·93	+	40·48	40·28	+	42·84	42·76
30	+	34·76	34·62	+	35·81	35·62	+	33·87	33·85	+	33·66	33·47	+	36·25	35·92	+	38·64	38·40
35	+	30·79	30·55	+	31·71	31·51	+	29·84	29·83	+	29·65	29·43	+	32·07	31·70	+	34·47	34·23
40	+	26·96	26·65	+	27·74	27·55	+	26·03	26·02	+	25·80	25·59	+	28·02	27·68	+	30·35	30·01
45	+	23·27	23·08	+	23·92	23·78	+	22·45	22·40	+	22·13	21·96	+	24·07	23·83	+	26·31	26·01
50	+	19·76	19·48	+	20·29	20·21	+	19·09	19·01	+	18·69	18·56	+	20·33	20·22	+	22·39	22·20
55	+	16·48	16·27	−	16·89	16·90	+	15·95	15·88	+	15·48	15·45	−	16·85	16·87	+	18·63	18·60
60	+	13·49	13·36	−	13·78	13·84	+	13·09	13·04	−	12·57	12·63	−	13·66	13·80	−	15·13	15·23
65	+	10·80	10·69	−	10·99	11·10	+	10·51	10·50	−	9·99	10·14	−	10·84	11·06	−	11·95	12·15
70	−	8·39	8·45	−	8·53	8·70	−	8·17	8·29	−	7·69	7·94	−	8·35	8·63	−	9·11	9·39
75	−	6·41	6·52	−	6·49	6·63	−	6·28	6·40	−	5·99	6·01	−	6·45	6·59	−	6·81	7·01
80	−	4·86	4·93	−	4·90	4·93	−	4·79	4·85	+	4·64	4·62	+	4·96	4·92	−	5·01	5·05
85	−	3·53	3·64	+	3·72	3·60	+	3·71	3·62	+	3·55	3·43	+	3·72	3·59	+	3·67	3·52
90	−	2·56	2·63	+	2·87	2·58	+	2·75	2·64	+	2·71	2·52	+	2·98	2·73	+	2·66	2·42

difference between the theoretical and the actual value exceed ·34 of a year, or less than 1 per cent., while in the majority of instances the difference is very much smaller, in five out of twelve affecting the second decimal place alone. The same correspondence is seen at all ages until the highest are reached, at which ages the differences are found to have increased in proportion to the actual values and to amount to as much as 10 per cent. of the other values, though the actual difference in no case is greater than ·3 of a year. On the whole, therefore, the graduation may be taken as satisfactory for most practical purposes. The formula, however, has certain defects. These are seen when the differences between the actual and theoretical values are examined. These differences are prefixed by a positive or negative sign according as the value given in the life-table graduation is greater or less than the value given by the theoretical graduation. It is found that between the years of 15 and 25 there is, in the great majority of cases, a defect of the actual from the theoretical. Between 40 and 55 there is regularly an excess, while between 70 and 80 there is again a defect. The constancy of this phenomenon suggests that there is a swing in life of a slightly different nature from that described by the formula. This, however, is more easily discussed with reference to the values of the death-rates and will be considered later.

There are, however, some other facts of special importance which connect the data contained in these life-tables. The twelve tables divide themselves into three groups as given in the tabulation of Section C. The first, that for the decade 1881–1890, contains three tables, one for England and Wales, a Healthy District Life-table and a table for Manchester. The second, that for the decade 1889–1900, contains a table for England and Wales, a Healthy District Life-table and a table for London. The third refers to the three years 1910–1912 and contains tables for England and Wales, the City of London, the County Boroughs, the Urban Districts and the Rural Districts. The expectations in each of these tables are related to the age by three constants a, c, and n. The respective values of these constants for the life-tables above included and also for a number of others of less importance are shown in Table III.

TABLE III.—*Showing the values of a, n and c for the chief Life Tables.*

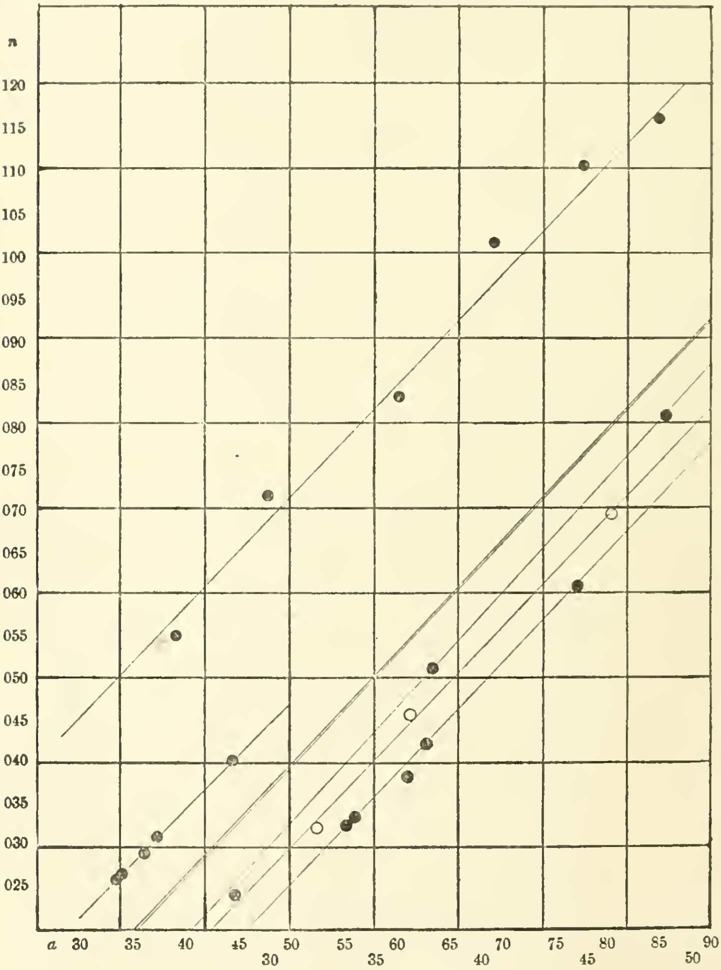
	a.	*n.*	*c.*		*a.*	*n.*	*c.*
H_1	4·8915	·05037	·04972	E_7	3·4861	·02743	·03323
E_5	3·7809	·03540	·03700	S_2	3·6012	·03327	·03697
B_1	4·0337	·04023	·03949	L_2	3·5536	·02985	·03415
O	3·2831	·03007	·03265				
M	2·8447	·02212	·02688				
H_2	4·6244	·04462	·04658	E_8	3·7440	·03103	·03622
E_6	3·6737	·03275	·03568	L_3	3·4086	·02678	·03240
B_2	4·1412	·04135	·04104	C B	3·3716	·02621	·03232
S_1	2·6975	·01789	·02499	U	3·6629	·02916	·03535
L_1	3·2255	·02609	·03055	R	4·4663	·04029	·04450

On plotting the values of these constants on squared paper it is at once found that for all the life-tables investigated the constants c and a lie on a straight line. The only exception to the almost absolute accuracy of the fit occurs in the values obtained with regard to the expectations in the Oldham and the second Salford tables. This correspondence between the values of c and a is remarkable. Considering the method by which the formula was derived, there should be no necessary correspondence, but a most marked and quite unequivocal correspondence has been found. What this means cannot at present be defined. It must, if the argument of the derivation is at all apposite, imply some profound vital adjustment.

The relationship between a and n is not quite so simple. As this point is of special importance, it is illustrated in a diagram (Diagram I). In this diagram it is shown that in each group of tables the values of a and n lie on straight lines, and that these straight lines are very nearly parallel. The lines describing the relationship between the constants for the decade 1891–1900 and for the years 1910–12 are almost absolutely parallel, while the lines describing the same relationship for the years 1881–90 lies at an angle differing from the inclination of these lines by about two degrees as drawn on the scale in the diagram. It was very desirable to ascertain whether this might be a true relationship or an accident. As before remarked, Dr. Farr published the data on which his law was based in the Decennial Report for 1860–70. With these data and by formula (6) it has been possible to calculate the expectations for seven groups of different density of population in England for this decade and to fit these expectations to the curve chosen. The plotting of the values of a and n was accomplished with fear and trembling. It was with a distinct sense of relief that

DIAGRAM I.

This diagram illustrates the relationship between a and n for the epochs from 1860 to 1912. It is drawn to two scales. In the left-hand side of the diagram above the double line the values of a and n for the epoch 1861–70 are shown above and the like values from 1910 to 1912 below. On the left-hand side of the diagram, below the double line, the values for the three epochs 1881–90, 1891–1900 and 1910–12 are shown on twice the scale. This doubling of the scale does not affect the direction of the lines and has been adopted so that the different observations may be shown with some degree of clearness.



they were found to lie upon a line practically parallel to those already found. The tangents of the angles connecting *a* and *n* and *c* for the four epochs are given in the accompanying table (Table IV):

TABLE IV.—*Giving the values of the tangents of the angles in the relations between the constants a, c and n.*

	$a = n \tan \alpha + p$	$a = c \tan \beta + p'$
1861–70	·01381	·01155
1881–90	·01431	·01176
1891–1900	·01294	·01142
1910–12	·10325	·01121
	$\alpha = 47' \pm 2'$	$\beta = 39' \pm 1'$

The angle in the first instance is approximately 47 minutes and the standard deviation 2 minutes. In the second case the angle is 39 minutes and the deviation 1 minute. It may thus be said that one law of health has held for England for those living above 10 years of life from 1860 to the present day. The improvement in health appears to be shown by the alteration in the position on the lines expressing the relationship between *a* and *n*. Certain points of difference, however, fall to be noted. As the values of *a* have decreased with the improvement of health, the range of variation of *a* and consequently of *c* and *n* have also decreased. It almost looks as if some kind of limit were being approached beyond which much greater improvement cannot readily be expected. It is not certain that the limit has been attained, but it is improbable that for persons over 10 years of age life will ever be much longer on the average than that exhibited in rural England at the present day.

The relationship of the quantities in each group of life-tables is very close. It is not necessary to give all the figures, but with regard to the series of life-tables made referring to 1910–1912 it may be stated that the correlation

between *a* and *c* is ·9933,
between *a* and *n* is ·9979,
between *c* and *n* is ·9977.

When suitable adjustments of *a*, *n* and *c* are made and the five tables brought to one basis, it is found that the new sets of figures obtained from the adjusted formula give as good a fit to the data as the formulæ first calculated.

H.—*Expectations at ages above* 85 *years.*

In the previous section the graduation of the expectations has been generally discussed. There is, however, one point which has not been sufficiently considered, and that is the difference at high ages between the expectations as given by the formula and by the life-table. The subject requires some special investigation The method used for calculating the expectations at high ages in life-tables can hardly be seriously justified *a priori* from the point of view of scientific certainty. Should the graduation happen to be successful the inference that the law of termination of life had been more or less approximate would be quite fair. But about the success of the graduation there is a grave doubt.

The higher the age the more inaccurate for the most part are the data given by the census and death registers in proportion to the total numbers. Of this fact most of us are all familiar with in our own family circles. It pleased, for instance, one of my grandfathers to say that he was born in the year one (1801), but when he died, and the baptismal register was referred to, it was found that he had been born in the year 1804, and in place of being 89 was only 86. Unless baptismal data are procurable, it is impossible to be sure of any age over 80 years.

It seems, therefore, important to make some kind of special inquiry into the value of the expectations at the high ages. The results of the inquiry are shown in the accompanying diagram, in which four sets of data are graphically exhibited (Diagram II). The first shown in the upper part of the diagram relates to the life-table E_8 calculated by Mr. King. The second relates to the life-table for males calculated on old and new insurances constructed on the experience of the insurance companies of this country between 1863 and 1893 $O^{(M)}$, and the third to the life-table for England and Wales, E_6. The fourth shows the expectations of those persons recorded in Burke's Peerage and Baronetage who were born between the years 1770 and 1800.

DIAGRAM II.

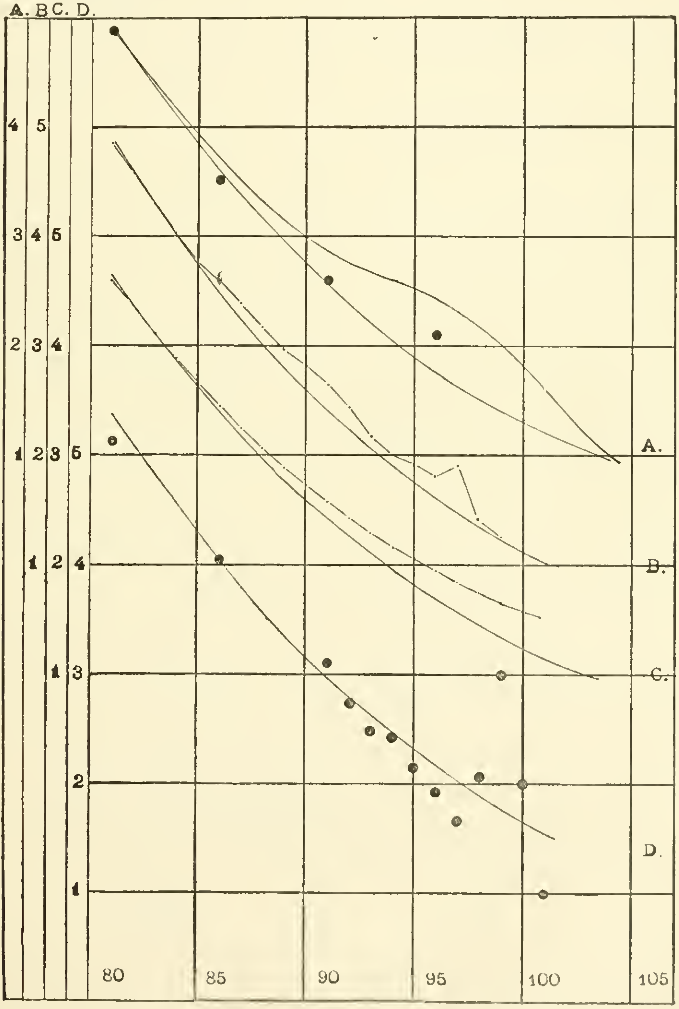
This diagram shows the comparisons of the expectations obtained by the formula and from the life-tables for four sets of data. The values of the expectations are indicated on the left-hand side of the diagram in years, each column from the outside inwards referring to the curves indicated by the letter at the top of the diagram.

(A.) The life-table for 1910–12, males (E8). The upper line shows the value of the expectations given in the life-table, the lower line those obtained by the formula. The circular dots are the values of the expectations obtained by correcting the census and death register statistics according to the method described in the text (*cf.* Table V.).

(B.) These curves show the comparison between the expectations obtained from the ungraduated data of the insurance companies of Britain, shown as a chain line, and the values of the expectations obtained from the formula shown as a continuous line.

(C.) This illustrates the life-table expectations and the formula expectations as obtained from life-table E6.

(D.) The expectations illustrated in this part of the diagram refer to the persons born in the Peerage, 1770–1800. The continuous line shows the theoretical values and the spots the values of the expectations obtained from the ungraduated data.



The results in Mr. King's tables first fall to be discussed. In the diagram the values obtained from the table and the theoretical values predicted from the series of expectations from 10 years to

85 years are severally shown. It will be noticed that they coincide at 85 and 103, but that there is a great excess in the life-table values between the ages, the maximum difference occurring between the years 95 and 96. The question arises—which of the two more nearly represent the truth? Is it possible that a kind of Indian summer occurs after the age of 85 years is passed, and that conditions improve as regards length of life on the grounds either of greater care being taken, or that the second childhood relieves nervous strain and thus permits some recuperative effect? I think, on the whole, Mr. King's values must be rejected. The data on which they are based are published for each year of age both for the population and deaths.

Treating these data as referring to a population which is not stationary, the method employed is to construct a stationary population for the two sets of data with the results shown by Mr. King. But this is not necessary. The rate of increase of the population between 1800 and 1830 is known with sufficient accuracy to permit of the adjustment of the data regarding persons over 80 years of age given by the census and death registers. Such a process, of course, can only be applied to a limited portion of the whole extent of human life. It is probable, however, that from 80 years and upwards the liberty of correction may be taken. The rate of increase of the population between 1800 and 1830 can be estimated roughly by the change in the number of baptisms. It is found that between the decade 1801–1810 and the succeeding decade the rate of increase was 1·13 and in the next decade 1·15. The number of births thus increase approximately uniformly at a rate of 1·14 per 10 years during the 30 years 1800–1830. Taking this rate of increase, it is possible to adjust the census and death registers statistics so that a stationary population results. This has been done both for males and females, and the results are given in the next table:—

Table V.—*Table showing the expectations given by Mr. King for the years* 1910–12 *at high ages both for males and females, with values obtained* (A) *by adjusting the population,* (B) *by adjusting the deaths as described in the text.*

Age.	Males.			Females.		
	Life table.	A	B	Life table.	A	B
80	4·90	4·95	4·81	5·49	5·34	5·32
85	3·72	3·52	3·51	4·19	3·82	3·96
90	2·87	2·69	2·52	3·16	2·92	3·02
95	2·43	2·20	2·06	2·39	2·47	2·36

It will be noticed that for males the three values are practically identical at the age of 80, and that thereafter the calculated values are in considerable defect of Mr. King's. With regard to females the three values are much more nearly in accord. This might be expected, as the number of females living at high ages is much greater than the number of males. When the values obtained by the methods given here are plotted in the diagram, it is found that at the ages of 85 and 90 years the values lay on the theoretical curve obtained by extrapolating on the present theory, and differ considerably from those derived by Mr. King. I do not think that any mathematical method of determining expectations at high ages which gives a higher expectation at 90 than that found by the adjustment of the census and death register data can be accepted as valid. At 95 years the differences of the values obtained by these methods have become considerably greater, the formula values being the least, the adjustment values next, and Mr. King's the highest. In further criticism, I think that the method based on the adjustment of the deaths must be taken as more accurate than the method based on the numbers living, though the data refer practically to equal numbers. The formula for obtaining the expectations from the deaths does not involve any interpolation, whereas that from the total population does, and at high ages to get an accurate interpolation figure is difficult when it is noted that the number of persons living at ages 89–90 is 1,921 and that at ages 90–91 is 1,448. On the whole, therefore, apart from the fact that the old people overstate their ages, the evidence of the data is against the high expectations obtained by Mr. King.

The next table shown in the diagram is that of the British Insurance Companies, $O^{(M)}$. In this the differences between the table values and the formula values are seen to be at no point very great—on the average less than ·2 of a year—while the general course is the same. Probably the formula slightly underestimates the expectation. The third curve in the diagram refers to the life table for England and Wales for the years 1881–1900. The values given in the table are probably in excess, though the difference found is never very great.

The fourth comparison is made with a table of expectations of those born between the years 1770–1800, whose ages are recorded in Burke's Peerage and Baronetage. This is a special class, but a class in which the data are probably very accurate. The expectations were fitted to the formula from the age of 30 to the age of 85 years.

The values thus obtained might be considered open to the objection in that those created peers or baronets would probably for the most part be so created at a more or less advanced age, and their inclusion might therefore tend to raise the average length of life. It was necessary, therefore, to measure the effect of this. Persons created peers or baronets, with the exception of those born in the purple, such as Lord John Russell, whose names would consequently be included whether they had achieved special distinction or not, were therefore taken out separately. This has resulted in the rejection of 49 persons out of the 622 who attained the age of 80 years. It is curious to note how uniformly the rejections were distributed. In the result the expectations calculated at 80, 85 and 90 years differed at most by two units in the second place of decimals from those in the first calculation. Such differences are far within the probable error of the result.

The expectations have been calculated for each individual year from 90 to 100 on the revised data, and the observations plotted in the diagram. It will be noticed how closely they fall upon the theoretical curve. In this instance it may be said, therefore, that on a theoretical curve deduced from the values of the expectations between 30 and 85 it is possible to extrapolate at high ages with absolute certainty. It may, I think, be said that after consideration of these four sets of data the formula given here is at least as trustworthy as the calculations made by the ordinary methods of constructing life tables.

I.—*Graduation of premiums.*

It has been remarked already that the formula used to graduate the expectations can be used to graduate the premiums. In order that the effectiveness of this graduation may be tested the premiums for a 1*l.* insurance at the end of life at a 3 per cent. valuation and a 4 per cent. respectively as given in the experience of the Manchester Unity have been fitted to the formula, and the results are shown in the accompanying table. To fit, the reciprocals of the premiums were used in place of the expectation. The fit when the higher ages 90 or 95 are excepted is exceedingly accurate, the difference being practically always less than 1 per cent., and in most cases much smaller. The premium, for instance, for 1,000*l.* insurance entered at the age of 20 is about 13*l.* per annum. The difference found between the actual and theoretical values is only 1*s.* 9*d.*, a difference which is quite negligible in the practical work of an office.

Table VI.—*Showing the graduation of* 3 *per cent. and* 4 *per cent. premium to the Formula I.O.O.F., Manchester Unity Experience.*

Age.	Three per cent.		Four per cent.	
	Actual.	Theoretical.	Actual.	Theoretical.
20	·01319	·01310	·01122	·01110
25	·01554	·01532	·01346	·01323
30	·01840	·01816	·01621	·01595
35	·02204	·02180	·01975	·01950
40	·02667	·02656	·02430	·02420
45	·03263	·03281	·03019	·03043
50	·04068	·04117	·03821	·03881
55	·05150	·05245	·04905	·05022
60	·06648	·06765	·06411	·06549
65	·08729	·08843	·08505	·08637
70	·11634	·11668	·11427	·11474
75	·15838	·15481	·15666	·15336
80	·21416	·20853	·21286	·20645
85	·27785	·28036	·27673	·27765
90	·35300	·35694	·35186	·36992
95	·48538	·50420	·48407	·52169

J.—*The number of survivors.*

Having obtained the graduation for the expectations from the age of 10 years and upwards, it remains to test whether the number of survivors can be adequately represented by figures obtained from the graduated expectations. The table chosen for comparison is E_6. The formula to obtain l_x from E_x is given in a previous section (No. 18). Starting with the age of 10 and taking identical numbers, the new populations have been calculated, and the figures are given for comparison in parallel columns in the accompanying table. It will be observed that the actual and theoretical figures differ little, the differences between the ages of 10 and 60 years nowhere exceeding ·3 per cent. After the age of 60 years the correspondence is not quite so close, though the difference does not exceed 1 per cent. At the age of 85 the numbers become very small—less, in fact, than a twentieth of the numbers living at the age of 10. The percentage error naturally rises, but even upwards of this age it is not more than might be expected when two methods of calculation are used, amounting to 4 per cent. at 85 years, to 6 per cent. at 90 years, and to less than 3 per cent. at 95 years. The graduation may, therefore, be taken as very satisfactory.

TABLE VII.—*Showing the number of survivors out of a definite number at the age of* 10 *years. Life Table* E_6.

Age.	Actual.	Theoretical.	Age.	Actual.	Theoretical.
10	73430	73430	60	40952	40814
15	72537	72300	65	33234	33007
20	71171	70914	70	24663	24412
25	69389	69228	75	15861	15729
30	67320	67155	80	8230	8319
35	64817	64699	85	3132	3260
40	61596	61623	90	772	819
45	57701	57838	95	106	109
50	53089	53211	100	7	5
55	47595	47566			

K.—*Graduation of the death-rates.*

It now remains to discuss the fitting of the death-rates, or what amounts to the same thing, the probability of living a year. It has hitherto been found impossible to graduate the curve of the death-rate, as given in any of the life-tables, from the age of 10 years and upwards to any simple formula. The obvious fact is that the death-rate increases with age. Probably after the age of 40, and certainly after the age of 50, senescence is the chief factor. As has been remarked, at the age of 10 the deaths due to childhood's diseases still play a part in the mortality, though not probably a great one. In the death-rate from 15 to 30 also the complex of growth and sex development must account for a good many deaths. No graduation hitherto proposed, except Prof. Pearson's, has made any attempt to estimate these. In spite of various attempts at graduation I have not yet succeeded in satisfying myself that I have done any better. It is not possible to discuss the subject fully in this place, but the following points may be noted :—(1) The great bulk of the death-rate after 30 is due to old age acting through a varying group of diseases. (2) As we pass from healthy to unhealthy districts we find that the mortality increases much, most markedly between 40 and 45 years of age, in relation to the mortality of healthy districts, than at ages above and below this. Prof. Pearson, in his graduation, makes a special group of diseases centering around this age. The shape of the curve he obtained is almost identical with that found when the death-rate curves due to different environments are compared. Such an element might be expected to appear, as a large part of the population of England lives in comparatively unhealthy environments.

The graduation of the expectations in this paper have been made at all ages from 10 to 85. From this it might be expected that the values of the death-rates obtained from the formula should be in defect of the actual about the ages of 20 to 30 (Table VIII). This is what is found in general. Especially in the recent tables the differences are considerable, amounting to 20 or 30 per cent. of the actual death-rate. From 30 upwards, however, the graduations of the death-rates are on the whole very good. The same differences obtained with regard to the expectations are again manifested, namely, that from 30 to 45 there is a general excess of the actual over the theoretical, from 50 to 70 a defect, and from 70 upwards again an excess. The curve of the formula swings backwards and forwards through the curve of the death-rate. The error is never very large, and hardly exceeds 4 per cent. The only place, therefore, where great divergence takes place between the graduated and the theoretical death-rates is at the earlier ages. In the tables before 1900 there is one further point which requires notice: the actual death-rate at 40 is considerably higher than the theoretical death-rate. This changes at the year 1900. I think this most probably due to differences in methods of constructing the life tables, though it is possible that the fall in the amount of phthisis may have an influence in producing this change. These seem to be the main points, but the whole subject requires extensive examination.

L.—*Conclusions.*

The conclusions reached in the investigations made are as follows :—(1) If the expectations be taken as the measure of vitality, they can be adequately graduated by a formula proposed, a formula which describes the rate of decay of capacities or of substances subject to the action of organic ferments, a process which may be held to be analogous to vital processes. (2) That the constants in the formula have a very close association, an association which links all life tables together. (3) That the formula, however, does not completely describe the data, but that the values obtained from the observations make a long swing from one side to the other of the values given by the formula, much in the same way as is found when the data are graduated on Makeham's hypothesis. (4) That the expectations at the high ages of life are probably more accurately given by the formula than by the ordinary life tables. (5) That the same formula also graduates the life insurance premiums.

Note.—In criticising the values of the expectation given by Mr. King, I desire to state that I am not criticising the method of construction used by Mr. King, which was designed to accurately represent the data, but the effect of the error if the data were used as a basis of actuarial calculation.

TABLE VIII.—*Showing the Theoretical and Actual Death-rates at certain ages.*

Age.	1881-90.						1891-1900.					
	E_5		H_1		M		E_6		H_2		L_1	
	Actual.	Theoretical.	Actual.	Theoretical.	Actual.	Theoretical.	Actual.	Theoretical.	Actual.	Theoretical.	Actual.	Theoretical.
10	2·13	3·39	2·20	2·85	6·46	3·91	2·21	2·85	2·05	2·11	2·33	3·50
15	2·63	4·06	2·61	2·86	4·28	4·93	2·87	3·47	2·25	2·53	2·99	3·55
20	4·70	4·88	4·07	3·87	5·34	6·52	4·45	4·28	3·63	3·08	4·04	4·56
25	6·17	5·93	5·18	4·59	8·06	8·53	5·60	5·34	4·89	3·75	6·07	5·85
30	8·15	7·35	6·41	5·52	11·06	11·00	6·58	6·72	5·23	4·66	7·18	7·57
35	10·03	9·19	7·30	6·75	14·12	14·21	8·75	8·53	5·89	5·85	10·91	9·86
40	12·40	11·67	8·56	8·40	19·60	18·16	11·69	11·02	7·43	7·49	14·43	12·23
45	15·41	15·06	10·32	10·68	24·68	23·56	14·55	14·44	9·09	9·77	17·96	17·13
50	19·46	19·79	12·97	13·97	31·03	31·17	19·03	19·21	12·23	13·03	23·27	22·94
55	25·59	26·57	17·23	17·60	40·56	42·03	25·19	26·02	15·95	17·81	30·68	31·01
60	35·32	36·43	24·39	25·67	55·53	59·76	35·45	35·07	24·06	25·04	41·25	42·45
65	50·09	50·92	36·26	36·75	77·41	79·13	49·11	50·33	34·77	36·32	56·24	58·74
70	71·94	72·78	55·53	54·73	107·43	107·96	71·93	71·94	55·75	54·55	80·17	81·77
75	106·09	105·85	88·56	85·01	147·36	146·72	107·02	104·85	90·68	84·82	116·36	114·96
80	159·33	156·75	143·78	137·10	199·08	197·40	158·58	154·23	144·94	135·74	167·64	162·72
85	240·37	235·89	221·90	229·10	267·16	263·00	231·99	228·61	225·27	221·23	236·15	230·78
90	359·86	355·80	365·99	386·32	352·27	348·00	341·73	340·45	339·41	361·17	323·71	326·69

TABLE VIII.—*Table showing the Theoretical and Actual Death-rates at certain ages—continued.*

Age.	1901-10.		1910-12.									
	E_7		E_8		L_3		C.B.		U.		R.	
	Actual.	Theoretical.	Actual.	Theoretical.	Actual.	Theoretical.	Actual.	Theoretical.	Actual.	Theoretical.	Actual.	Theoretical.
10	1·86	1·34	2·04	1·38	—	—	—	—	—	—	—	—
15	2·49	1·95	2·23	1·87	2·38	2·17	2·70	1·95	2·48	1·40	2·07	1·66
20	3·68	2·63	3·38	2·52	3·13	2·95	3·68	2·75	3·37	2·02	3·01	2·14
25	4·50	3·58	3·96	3·37	3·93	3·99	4·40	3·74	3·91	2·85	3·69	2·76
30	5·52	4·87	4·69	4·50	5·16	5·37	5·41	5·24	4·35	3·98	4·23	3·58
35	7·16	6·62	6·09	6·04	7·22	7·24	7·22	7·17	5·48	5·53	4·90	4·68
40	9·13	9·01	7·93	8·15	10·03	9·78	9·57	9·83	7·11	7·65	5·92	6·24
45	11·95	12·20	10·90	11·10	13·60	13·30	12·96	13·53	9·51	10·66	7·71	8·43
50	16·20	17·03	14·45	15·30	18·29	18·25	17·84	18·78	13·61	14·93	10·20	11·55
55	22·55	23·72	20·56	21·34	24·97	25·27	24·97	26·21	19·53	21·11	14·53	16·14
60	32·01	33·35	29·76	30·27	34·99	34·72	36·07	36·95	29·22	30·22	21·89	23·20
65	45·09	47·87	43·06	43·53	48·04	49·94	50·64	52·45	42·92	43·71	33·02	34·14
70	66·48	68·45	64·14	63·46	70·12	71·24	77·61	75·64	66·83	64·34	52·98	51·73
75	101·69	99·18	98·29	94·19	100·41	102·74	117·40	111·78	103·84	95·32	86·87	80·57
80	147·67	144·49	148·33	141·12	156·32	148·74	163·43	158·26	146·83	142·07	157·72	128·24
85	217·25	212·51	214·37	211·41	216·56	215·23	228·39	229·89	227·49	212·96	209·50	206·85
90	335·66	314·61	309·74	317·15	307·46	314·61	317·96	332·23	303·96	297·51	318·64	329·54

Discussion on Dr. Brownlee's Paper.

Captain Greenwood, in moving the vote of thanks to the author, said that Dr. Brownlee's Paper raised so many interesting questions that they would naturally be unable to discuss them all in detail, and he wished only to refer to one or two points. It seemed to him that the main division of Dr. Brownlee's Paper was, first, into that of the inner meaning of the life-table figures regarded as ultimate facts, and, secondly, as to the deduction from the original data of certain constants of the life-table. He thought perhaps a slight confusion might arise in some readers' minds owing to the use of the word "graduation," in more than one sense. For example, Table VIII, the last table referred to, was a comparison between the results obtained upon Dr. Brownlee's hypothesis, and the figures in those life-tables which were already graduated, whereas in some of the tables Dr. Brownlee had applied his method to original ungraduated data. It seemed to him the question of the appropriate graduation of original data was mainly a technical one for the actuary and was rather outside their province. As he understood the matter, the fundamental requirements of the actuary were, firstly, that the method of graduation should reproduce the original observations with as few deviations as possible, and, secondly, that the method should be arithmetically practicable. He gathered that the methods of graduation enjoying the widest popularity were in effect empirical applications of interpolation formulæ, no law of mortality in Dr. Brownlee's sense being assumed. It seemed to him, however, that it was well worth noticing what Dr. Brownlee had emphasised, viz., that the Gompertz-Makeham method which did start from *a priori* assumptions and had frequently proved effective, was, as Dr. Brownlee had pointed out, capable of being interpreted in biological terms. Passing from graduation in the narrower sense, which seemed to him to be a matter for technical discussion, the main point of Dr. Brownlee's Paper was the general co-ordination of the life-table data. He thought they would all agree in admiring the ingenuity with which Dr. Brownlee had chosen the physico-chemical formulæ, and they would all be interested in the agreement between the expectations derived from those formulæ and the actual figures; but it was necessary for everyone to bear in mind that what Dr. Brownlee had done was as a mathematician would say, to fulfil a condition which was necessary but not sufficient. He thought people who were not very much versed in statistics were rather inclined to be over-impressed by the agreement between what was called the theoretical value and the observed value, in a set of data, and he thought it was well to emphasise the warning on that point which Dr. Brownlee gave in the Paper, and also in a recent Paper read before the Epidemiological Section of the Royal Society of Medicine. The point was that it was a common enough experience in any statistical enquiry to obtain very close agreement between "observation" and "theory" even when one knew that the "theory" was wrong or at least incomplete. Take, for instance, the case of a number and its logarithm. Were one restricted to a small range of numbers and their logarithms, say, a single page of Chambers' Tables, the correlation between the two would be found to be extremely high (for 15 consecutive numbers, he found it in a random trial to be ·98) and the agreement between "observation" and "theory"—"theory" here being a linear law—would be very pleasing. Unfortunately, as he and Mr. Yule had found in investigating some theories of immunity, Nature had rather a habit of presenting one with odd leaves from an inaccessible volume, and this made the discovery of her statistical laws rather difficult. He was not therefore entirely convinced by the extremely high correlations between the constants Dr. Brownlee had got or by the close agreement between points in his diagram and the straight lines. After all, in some of them the range of the points was very small, and the total number of points fitted was likewise small. He was not by any means intending to criticise the basal theory; but it seemed to him one ought not to be too greatly impressed by the agreement between theory and observation. Many examples could be quoted. Taking another case from some work which Mr. Yule and he had been recently doing, they could fit the distribution of multiple accidents among factory workers with an accuracy which was measured in the ordinary goodness of fit tests by values of P. of over ·9. They could fit the same data to this degree of accuracy by formulæ derived from two contradictory theories, the mathematical expressions of which were totally distinct one from one another. These cautions seemed to him to be necessary when one was considering the statistical justification of theoretical formulæ. He thought that at the present time the remarks Dr. Brownlee made with regard to Farr's law were of great value. He entirely concurred with what Dr. Brownlee said in attaching the greatest importance to this section of his Paper, and for the reasons suggested in that paragraph. The point was that before the War there had been in public health discussions a steady stream of a sort of military metaphor: people were going to start a campaign against tuberculosis or were going to stamp out infant mortality—or do something similar of that kind; and that method of propaganda was now being revived in connection with reconstruction. It seemed to him very necessary to emphasise the fact that health was a unitary process—that the military metaphor was inexact, and that it was a question of changing the totality of conditions not of instituting particular campaigns. The idea of a unitary process was old; it was strongly emphasised by Sydenham, in the seventeenth century. It was brought into prominence again by Watt at the beginning of the nineteenth century in connection with zymotic diseases, and Dr. Farr, with the prescience which, as Dr. Brownlee had said, characterised everything he wrote, had drawn special attention to the substitution principle. The point was that there was reason to doubt whether great changes could be made in the public health by attempting to eliminate particular factors. Whatever might be the basis of Farr's law, the uniformity of its expressions in Dr. Brownlee's series deserved the most careful consideration. Even if there were no other grounds—and there were many other grounds—for congratulating Dr. Brownlee and thanking him for his Paper, that ground would, in itself, be sufficient for them to be entitled to pass a very hearty vote of thanks to him for his Paper.

Mr. FINCH said it was a very great pleasure to rise to second the vote of thanks to Dr. Brownlee. It was most gratifying to find that Dr. Brownlee had picked on some old work of Dr. Farr's and developed it in the way he had done. Some little time ago a writer in the *Journal* of the Society had said it was a pity that statistical investigations were buried in departmental reports. He thought it was rather a pity that the departmental reports should be given such little attention. In any case Dr. Brownlee had taken up the law formulated of Dr. Farr, and had shown that that law, which was based on crude and imperfect material, still held. On the theoretical side of Dr. Brownlee's Paper he did not wish to say anything, but it was extremely interesting to find that a law that was found to hold in other branches of physical science applied so nearly to the curve of mortality also. He might mention, what was perhaps not generally remembered now, that Dr. Farr's first life-table was based on an assumed law of mortality. Death-rates were taken in quinquennial groups of ages and were very irregular. Dr. Farr, however, came to the conclusion that mortality increased at a geometrical rate over a certain period of life and at another geometrical rate in later life, and applied a geometrical formula between the ages of 15 and 55, and connected it up with another geometrical formula from the age of 55 to the end of life. This method was used in the construction of the life-table for the year 1841. The second life-table referred to the period 1838–44, 1841 being the middle year of the period. The existence of a law of mortality was no longer assumed. Dr. Farr determined death-rates at certain fixed points of life, and simply carried through them a curve of mortality not on any particular assumption but simply by means of a finite difference formula, and got results which agreed almost precisely with those of the first life-table. Ever since then official life-tables had been constructed in a similar way, but no general law of mortality had been assumed. It was very interesting to find now that Dr. Brownlee had been able to fit a general law to the results of those life-tables. He wished to make one or two points in connection with that work. Dr. Brownlee said his formula did not exactly interpret the data. If they turned to the table for 1881 to 1890, they would find there was a very big difference in Table VIII between the actual and observed death-rates at the ages of 10 and 15. He thought the difference should not tell too strongly against Dr. Brownlee's theory, but rather against the actual death-rates of the published life-table. For some reason or other those death-rates were given too low; that would be almost obvious to anybody. If they followed the run of the actual death-rates in the life-tables they would see that the death-rates at the ages of 10 and 15 were shown as being lower in 1881 to 1890 than they were in 1891 to 1900, despite the general fall of the death-rates that had taken place at those and at other ages also. In the graduation of life-table No. V (1881–90) the deaths and the population were tabulated in decennial ages, 5 to 15 and 15 to 25, instead of four quinquennial ages, 5 to 10, 10 to 15, and so on. With that scheme of interpolation he felt that rates of mortality were derived for those ages that were much too low; at all events the death-rates there were much lower than the death-rates published in the Registrar-General's Annual Report, and in that respect life-table No. V for 1881 to 1890 (and the Healthy Districts Table for the same period) differed from all the other life-tables which Dr. Brownlee had dealt with.

With regard to the death-rates over age 65, the official life-tables had been criticised by Mr. King before he constructed the last two English tables for 1901 to 1910, and 1910 to 1912. He urged that the death-rates at the high ages (those somewhere about 85) were too low. They probably were. At the time of the 1901 Census the results were very carefully examined and an attempt was made to estimate the number of persons living in any age period, for example, 65 to 75, by deducting the appropriate numbers of deaths from the number living ten years earlier in life at the preceding Census. It was recognised at the time that the method was not a perfect one. For example, they did not know whether the number of deaths was correct—or rather they knew when they were incorrect, but not to what extent. It was found that in 1861 the number of males enumerated over 85 was more than seven times the number calculated to be surviving out of those living ten years earlier at the preceding Census. The total living over 75 showed an excess of 25 per cent., and those over 65 an excess of 6 per cent. the calculated number. With succeeding Censuses the error gradually disappeared, until, in 1901, it was comparatively small; but when the figures given in the general report of the Census 1901 were looked at, he thought one was driven to the conclusion that there had been a great deal more over-statement of the ages at the Census than there was in the death Registers. Despite any error that might have been introduced by misstatement of ages at death, he felt convinced that back, say forty or fifty years, the amount of over-statement in the ages at the Census was very considerable, and at earlier dates the errors were probably greater still. The published death-rates at the highest ages were probably much understated, and it was rather surprising to find that Dr. Brownlee's values of the expectation of life at those high ages, calculated in quite a different way, agreed as nearly as they did with the values shown by the official life-tables. He must say that the figures given by Mr. King showed rather a curious bulge, but from the point of view of the general teaching of the life-table the matter was quite unimportant.

Dr. Brownlee had referred to the hump on the death-rate curve at the ages of adolescence, and attributed it, he thought, to developmental causes, and not to particular diseases. In the case of English mortality, if phthisis mortality was removed from the total, the hump was removed in large measure. The removal of violence in the case of males still further smoothed the curve. He himself thought it was largely due to phthisis, but that was neither here nor there. He thought Dr. Brownlee's formula would smooth out the hump, and the question was whether it would do so or not. Taking Dr. Brownlee's theoretical figures for 1891 to 1900, the death-rate at the age of 15 was 22 per cent. higher than that at the age of 10. The death-rate at the age of 20 was 22 per cent. higher than at 15, and that at 25 was 24 per cent. higher than at 20, and the increase in the next quinquennial age period was 26 per cent. The rate of increase remained practically constant. Taking the actual figures, it would be found that the differences in the rates of increase were very marked. The increase per cent. in the first quinquennial period was 30, in the second period 55. and in the third and the fourth periods only 18 per cent. Mortality rises rapidly over a few years of life, after which the rate of increase falls very considerably. This feature does not apply only to English mortality but is universal, and is, in fact, much more marked in some other countries than in England. Dr. Brownlee was speaking about human mortality in general, and had tested it only against English mortality. He, the speaker, thought it would be extremely interesting to find how the formula would fit the mortality curves for other countries. The life-table for Norway (1901 to 1910) showed a mortality curve which rose with extreme rapidity between the ages of 14 and 17, the increase being as much as 26 per cent. in the year of age 15 to 16. After age 22 the death-rate declined for a period of no less than 11 years. The death-rate at the age of 22 was 9·4, and then fell to a minimum of 7·3 at ages 33 and 34, and it was not until the age of 47 that the rate again stood at the level it reached at the age of 22. In the case of females there was a rapid rise in the period of adolescence, and that was followed by retardation, but the rate never actually declined. The curve for Sweden showed the same feature, but in a less marked degree. In Japan the death-rate fell from 8·7 per 1,000 at the age of 22 to 7·8 at the age of 29, and it was not until the age of 35 that it reached the point it stood at 22. It seemed probable that if Dr. Brownlee's formula were applied to the mortality curves for those countries, they would wipe out a good deal of that curious hump in the mortality curve. He did not know whether Dr. Brownlee could say off-hand whether that would be so, but he thought it would be extremely interesting if they could know at some future time whether the formula did apply to the curves of mortality of these and other countries.

Another point was with regard to what death-rates should be used. He supposed they were all familiar with most of the arguments, and all agreed that the crude death-rate was not of much use, but that the standard death-rate was the one that should be used for comparing the mortality of different areas, but it was not the death-rate which Dr. Brownlee wanted for the purpose of his investigation. He took it that the life-table death-rate was vitiated to some extent by the varying proportions of persons living at different ages in the different life-tables. In a healthy district they had a large number of people surviving to old age where they were subject to a high mortality, and the life-table death-rate at any age—5, 10, or 15 and upwards—would be vitiated by that factor, and was not strictly comparable with that of another district. It seemed to him there was an inherent difficulty in measuring the death-rate as a ratio of persons dying to persons living. The difficulty seemed to be that they were using a unit of measurement that was not fixed. In all the death-rates the unit of measurement was a life, and a life is of variable length. Leaving out of consideration the value of a year of life at any age from an economic or other point of view, he thought the death-rate, except when measured at a particular moment of life, or over a short period such as one year of age, was a defective measurement. The defect might be remedied by applying the future lifetime at each age and thus loading each year of life with its proper weight: a satisfactory measure might then be obtained. The expectation of life is of course quite a different measure. In that case the unit of measurement is a year of life, and is an absolute measure. There is no doubt that Dr. Brownlee had made the proper selection in using the expectation of life primarily for the purpose of his investigation, and there is no doubt also that in the choice of death-rates he had rightly selected the life-table death-rate as being preferable to any other death-rate in general use.

Mr. W. Palin Elderton said it was a great pleasure to him to have been present and listened to the Paper. He was afraid that one who by misfortune happened to have to carry on his life as an actuary was bound to look at graduation and anything to do with mortality tables from a different point of view from the biologist, and the first thing that occurred to him was to look at the death-rates—what actuaries called the force of mortality, rather than the expectations. The reason was because one instinctively felt that it was necessary to see not only that the premiums for insurance over the whole term of life were correct, but also that if they had to quote for an insurance of merely one or two years, the chances of death for those two years were so nearly equal to the "actual" in the graduation that there was no likelihood of charging a premium which would lead the company one happened to represent into some unfortunate disaster by under-charging, or the poor individual who had to pay the premium into the difficulty of paying very considerably more than he ought properly to be asked to pay. From that standard he could not help feeling that some of the comparisons between "actual" and "theoretical" in Table VIII fell short of what an actuary would want from his point of view. Dr. Brownlee started by graduating the expectation of life, and the comparison of the "theoretical" and "actual" in the expectation of life looked fairly close, but when one turned over to the next page the death-rates looked further apart. He was afraid he had suffered from that difficulty himself, so he could at any rate say he was very sympathetic. Some time ago he had made certain graduations of expectation, and then tried to get his death-rates from them with the same unsatisfactory result. He thought the explanation in his case was that he could not find any convenient curve-fitting process to get his expectations which would give him a sufficient number of decimal places; so that when he translated from his expectations to his rates of mortality he only really got about one significant figure. If they worked from an expectation to two or three places of decimals. they would get a rate of mortality at young ages in which perhaps only one figure was significant. He thought that was one of the reasons why rates of mortality, from the actuary's point of view, had turned out to be rather a better function to choose for graduating than the expectation of life. Of course from Dr. Brownlee's point of view as a biologist it might be different, and probably was, and he was debarred from that point of view as he knew nothing about it. Dr. Brownlee had made the remark that there was a difficulty about fitting N $(c - x)^b$; he had not looked it up, and had not had much time to work it out, but he would have thought *a priori* that it could have been fitted by moments without any great difficulty; he was, in fact, under the impression that the solution was given about two years ago by Professor Pearson, in a Paper before the Royal Society, on "Further Special Cases of Frequency Curves." He had not been able to look up the reference, so very likely he had overlooked some point. In finding whether any particular formula such as that adopted by Dr. Brownlee, or the Makeham or Gompertz formula would really graduate any body of data, he suggested that in comparing the actual and theoretical one might assume that the formula was not perfect for the point of view of describing the data if they had a long series of minus deviations, and then a long series of plus deviations, and so on. With a satisfactory formula the deviations between their actual and theoretical change sign often. In other words, might not the waves which Dr. Brownlee noticed in comparing his actual and theoretical be due to the use of a mathematical expression which really was not suitable to describe the facts? He did not wish for a moment in making the remarks to give the impression of being unduly critical. He knew that his point of view could not be the same as that of a biologist, and he was probably overlooking all the points which were important to a biologist; but he threw out the suggestions he had done in case they might possibly be of some help in the future work which he gathered Dr. Brownlee intended to do, and, if they were, he would be certainly very glad. To one who had made a number of shots at graduations and often had had a disappointment over them, it was interesting to study other people's attempts. It was difficult to find a formula for graduation, and any hint from other people was very welcome.

After all, graduation was an attractive and fascinating thing, but it was miserably tantalising.

Dr. Stevenson said he entered the Meeting fully expecting to find Dr. Brownlee's Paper meet with a more enthusiastic reception than it had so far received, but in view especially of the cautions they had been given by the proposer of the vote of thanks, he must endeavour to curb his own feelings on that subject. He would only say it seemed to him that if the thesis that a formula devised to express the action of ferments and the fate of micro-organisms was applicable to the facts of human mortality, they might look in the future with considerable interest upon the fact that they were present on this occasion. There were one or two points of detail in the Paper to which he wished to refer. First, with reference to the use of age group death-rates for the purpose of comparing mortalities, he thought that was done scant justice to, because one strongly felt there were many points which could only be brought out when the individual elements of which the total mortality was composed were scanned. He would not quote examples, but one constantly came across such cases. In that connection, infantile mortality and its constancy in areas of different types under one month of age was referred to in the Table. If the analysis by age was further pushed, the constancy was found to be restricted to the first week of age, and he thought it an interesting fact that although that constancy was always present as regarded the distinction between urban and rural types of area, it was not present if they contrasted different geographical sections of the country. He could only speak for their own country; but the south of England uniformly presented a quite considerably lower mortality even in the first week of life than the north of England did. A point on which the Paper seemed to him to be somewhat pessimistic was the question of further reduction in mortality. From the mathematical methods employed by him, Dr. Brownlee was apparently inclined to doubt whether the mortality of the healthy districts was likely to be materially further reduced. It seemed rather strange that that should be the case when they saw what had happened in the last fifty years. Fifty years ago mortality from fevers formed almost 5 per cent. of the total mortality of the country. It now formed an absolutely negligible fragment, and similar statements might be made with regard to the other causes of death. Were there no causes left which might yield to appropriate measures in a similar way? If, for instance, deaths from violence were removed from the field, as was theoretically, if not practically, possible, surely quite a number of lives would be saved to live to old age which, at present, were lost in that way. With regard to Farr's Law of Density, he must say he felt a difficulty, which was referred to by Dr. Brownlee, in the fact that a number of dense populations were in a position to show a low mortality. He supposed the Peabody Buildings was perhaps the best known instance. Was it not conceivable that with improvements in administration the densely populated areas might more and more be turned into Peabody Buildings. If they were, and in so far as they were, surely the law of variation with density must diminish in its force. This view appeared to be implied by Dr. Brownlee's two statements (1) that the mortality of the healthy districts is unlikely to show further material decrease, and (2) that densely packed populations may maintain a high general level of health. If there is much opportunity for decrease of mortality in the case of the latter and little or none in that of the former, surely we may look forward to decreasing variation with density as the mortality of the crowded areas is more and more approximated to that of the present healthy districts. Another difficulty he felt in regard to Farr's law was that it was not universal in its application, as a natural law should be. Whereas in this country, as pointed out in the Paper, infant mortality was constantly higher in town than country, the relationship was reversed in much of Central Europe. The country districts had long shown the higher mortality in Austria and Southern Germany, and of late years the same ratio had been established in Prussia.[1]

Professor EDGEWORTH desired to join in the praise of Dr. Brownlee's Paper. Dr. Brownlee had made a notable contribution to the philosophy of graduation. He had won a high place among those who sought to read the action of regular causes in the configuration of a life-table. Such were Gompertz and Makeham, to whose hypotheses allusion had been made. Professor Pearson, too, must be placed in this class. For though he had not assigned so definite a cause as some of his predecessors, yet he had shown how to graduate a table of mortality by means of a formula not devised *ad hoc*, but of wide application in other fields; the universality of which argues its connection with laws of nature. Dr. Venn also had—to use the phrase of a previous speaker—made a shot at graduation. At least he had shown that Nature seems to make a shot at the typical length of human life—about three score and ten. The numbers of persons dying (in a stationary population) in the neighbourhood of that age are grouped much as shots on a target to the right or left of the bull's-eye (according to the normal law of error).[2] These and other formulæ are found to fit the observations fairly well. We must not be carried away by Dr. Brownlee's success in fitting his theory to the facts, as if such consilience was very rare and difficult of attainment. He (Professor Edgeworth) agreed with what Dr. Greenwood had said on that matter. He could confirm Dr. Greenwood's statement by his own experience in the construction of a formula to represent progressive taxation, such as the present British income-tax. It was not difficult to obtain a fairly good fit with different *functions ;* given a sufficient number of *constants*, say at least two or three. If you determined the constants so that the formula should fit exactly at a few points, it would be a fit to fit approximately in the neighbourhood of—or even at a considerable distance from—those pivots. Of course the function must be of a kind suitable for the purpose. All functions were not suitable for all purposes ; as Professor Pearson had pointed out in his observations on curve-fitting. Thus the parabola of many degrees, though suitable for many purposes, was not generally appropriate to laws of frequency. If the formulæ which, so to speak, had been examined for honours in graduation came out nearly equal, he would suggest an additional subject for examination. Beside the general conditions which a graduation formula might be expected to fulfil, it might be subservient to some special purpose. Thus the Gompertz-Makeham formula afforded special facilities for the calculation of annuities upon joint lives.[3] A distinguished actuary had said that owing to the great convenience attaching to the use of this formula, it is worth while to "stretch a point in its favour."[4] He (Professor Edgeworth) would like to ask other experts whether they agreed in attaching great importance to that convenience ; and if so, whether any compensating special advantage could be ascribed to any of the rival formulæ.

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[1] Even before this change occurred in Prussia there was little evidence that mortality there varied in accordance with Farr's law. Thus in 1894–97 (*Prinzing*, p. 454) female mortality was higher in the country districts than in the great towns at all age periods, except 0–5, 40–50 and 50–60, while that of the great towns was in excess of that of the smaller only at 0–5. For males the ratios were less dissimilar to those obtaining here. The Prussian life-tables for 1901–05 and 1905–06 also show approximate equality of expectation at birth for females between town and country, though infant mortality was still at that time higher in the towns.

[2] Venn "On the Nature and Uses of Averages," *Journal of the Royal Statistical Society*, vol. liv. (1891), p. 443; referring to Lexis (*Massenerscheinungen*, p. 12 *et seq.*).

Mr. YULE said he wished to add his tribute of interest in and admiration for the Paper. Like all Dr. Brownlee's Papers, it was extraordinarily stimulating to the reader, though very often stimulating him to contradiction, partly because he did not, at first sight at least, feel able to agree with Dr. Brownlee, partly because he wanted the author to give further explanations on points which were obscure. It stood, of course, to reason that in the very short time he had had at his disposal to read the Paper, he had not been able thoroughly to study it nor to grasp the whole of the author's reasoning : he could only raise one or two questions. First, it struck him, in connection with Dr. Brownlee's formula, as it had often struck him with surprise in connection with the Gompertz-Makeham law, that it was really astonishing how such formulæ did fit the facts, or rather fitted the figures, considering how little consilient they probably were with the facts and how little consilient the facts were with those ideal facts they would like to have. People told untruths about their ages at the Census and about the ages of their relatives at death ; people had not been subject throughout all their lives to one and the same uniform environment as they would like them to have been; nor had the people of different ages which appeared in the life-table been subject to the same environments. Frankly, the data were, for the purpose, abominably bad, yet on a certain theory a formula was obtained which fitted them extremely well. In such circumstances, was it or was it not in favour of the formula that it did fit the facts well? A second point he wished to raise concerned the particular formula in the Paper. Its theoretical justification, as he understood it, was that it might represent some sort of chemical action that went on in the body, the dying away, say, of some substance. That explanation differed from the explanation of the law of mortality observed in bacteria subject to a disinfecting solution, inasmuch as that was definitely a mass law applied to the mass of bacteria. Here they were dealing with a mass law, but, if he understood it rightly, the explanation given was an explanation for the individual. But individuals differed. Other speakers had already touched on a point which he had raised himself in a short conversation with Dr. Brownlee before the Meeting. He had been greatly puzzled by a paradox regarding the suggested use of the life-table death-rate. They did not use crude death-rates because such rates were based on populations of divers age distributions. But the life-table death-rates were specifically based on populations different for each district. Yet he would not like to say they were invalid, because he would accept the reciprocal of the death-rate, namely, expectation of life, as some measure at all events of vitality. He could not, therefore, deny to its reciprocal the title of a measure of mortality. Perhaps Dr. Brownlee would be able to clear that point up. He would have been glad if he had been able to devote a little more space in his Paper to the question of the use of the life-table death-rate. Taking again the general point that was raised by Captain Greenwood, regarding the necessity for caution in accepting empirical formulæ as necessarily being the rational formulæ, he did feel some doubt as to the density formula of Farr's law, to which Professor Edgeworth had also referred. It struck him at once that if the density of a district were zero, the mortality by the formula would be zero; if the density were extremely low, the mortality would tend to vanish. Was that really a likely result? He would have thought that some law such as "death-rate equals a constant plus a term dependent on the "density" would have been more probable. He did not see why a population with a vanishing density should have apparently a vanishing death-rate. In conclusion, he would like to repeat that those were simply points which had struck him in what had necessarily been a very hasty reading and only served to emphasise his real interest in the Paper which Dr. Brownlee had presented.

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[3] See De Morgan, *Assurance Magazine*, vol. viii., p. 181.

[4] *The Theory of the Construction of Tables of Mortality*, by G. F. Hardy, pp. 71, 73.

The CHAIRMAN, in bringing the discussion to a close, owing to the hour, wished to say that it had been almost a model discussion, and he had great pleasure in putting the vote of thanks to the Meeting.

The vote of thanks was put to the Meeting and carried unanimously.

Dr. Brownlee, in reply, said he was afraid there was not sufficient time to answer all the points which had been brought up. There were, however, one or two points on which it was necessary to say a word. Mr. Yule had drawn a distinction between the constant death-rate obtained in experiments regarding the destruction of bacilli in the act of disinfection and the case which he had considered where each individual life decreased in vitality according to a certain law. The case Mr. Yule considered simple, namely, that of disinfection, was not really so. In fact, it was so difficult that no one had been able to explain it unless it were assumed that the life of a germ depended on one single unit in the cell. On this no experiments had hitherto been devised, and though the formula of the unimolecular reaction describes the facts, the constant death-rate found can only be taken as an experimental result. That the subject was complex was shown by the fact that when organisms so high in the scale as a planarian worm were placed in a weak alcoholic solution the rate at which they became immobile corresponded to the formula of the uni-molecular reaction. In the case he considered he was averaging over a large number of lives trusting to get average values of the constants in the formula which would admit of comparison. Referring to the criticism of Mr. Yule that the relationship of the density and the death-rate implied that if the density went down to zero the death-rate would also be zero, he thought that the formula must be taken as representing that portion of the facts within the range of direct observation. There was a death-rate below which it was impossible to get and the number of persons living with this ideal death-rate is necessarily very small. Farr's law could only be taken as representing the facts within this range. Dr. Brownlee thanked the critics for the kind way in which they had received his Paper. He knew quite well that much of what he said must appear more than a little doubtful, and he did not wish to make it appear that more than a first attempt at graduation had been made. On this point he referred to what Major Greenwood had said with regard to Diagram I. He himself thought, however, that though observations were few from necessity the degree of parallelism of the lines added a very considerable verification to the value of the observations. When the same kind of result was obtained on three or four occasions, even though the number of observations were small, the combined result might be of very considerable value.

The following candidate was elected a Fellow of the Society :-

I. G. Gibbon, C.B.E.

A NOTE ON GERMAN AND ENGLISH WAR-TIME DIETS.

By MAJOR GREENWOOD (Capt., R.A.M.C., T.F.) and
CECILY M. THOMPSON.

THE German Imperial Statistical Department[1] recently issued an analysis of some data relative to the cost of living in German towns collected in 1916 and 1917 by the Kriegsausschluss für Konsumenteninteressen. This analysis, which has been carried out with an elaboration which the comparative paucity of the original observations, perhaps, hardly justifies, is mainly concerned with economic details. We think it may be of interest to some readers of the *Journal* to give an evaluation of the dietaries from the physiological point of view. With that object we have computed the daily consumption of the three main constituents of a diet and also the yield of energy expressed in calories.

Comparison of German and English diets, 1916–17.

	Numbers of people.	Grams per head daily.			Calories daily.
		Protein.	Fat.	Carbo-hydrates.	
Average of German town diets, April, 1916.	823 families	63·8	60·9	389·1	2,352
Average of German town diets, April, 1917.	342 families	57·6	48·2	343·1	2,007
Average of 6 canteens and hostels in England and Scotland, June, 1917.	6,750 people	110·8	130·4	366·2	3,168 (3,073)
Average of 3 hostels in England, April, 1918.	1,843 people	86·7	69·4	434·0	2,782 (2,699)

Butter, margarine and lard per head per day.

	Grams.
German diet, April, 1916	28·7
,, ,, 1917	18·0
English diet, June, 1917	43·3
,, April, 1918	22·3

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[1] *Beiträge z. Kenntnis der Lebenshaltung im dritten Kriegsjahre* 17. *Sonderheft zum Reichs-Arbeitsblatte.* Berlin, 1918.

We have employed the analyses of foodstuffs given in the eleventh edition of König's *Nahrwerttafel* (supposing them to be more accurately applicable to German foods than the standards adopted by the Royal Society's Food (War) Committee for English diets), and the energy figures are net values, allowance being made for loss in digestion—not, of course, for loss in preparation. The results are shown in the table, which also contains the most accurately comparable data of consumption in England which we possess. These latter figures relate to hostels boarding English munition workers. Certain reservations must be made before instituting a comparison between the English and German results. The calorie values of the English diets were obtained by using Rubner's coefficients, and do not therefore make sufficient allowance for loss in digestion; the resulting exaggeration is about 3 per cent. The figures in brackets in the last column are more properly comparable with the German averages. Further, the German system of "man" values, which we have adopted, rates all persons over the age of 11 years as "men," while there are good reasons for supposing that the average consumption of an adult woman is less than that of a man doing the same class of work (although not necessarily the same amount of work). If our two samples of munition workers had each contained men and women in the same proportions this fact would not have affected the comparison; but it happens that our second sample refers only to hostels for women, so that the fall in calorie value between 1917 and 1918 in England has been exaggerated. Lastly, the German data refer to a mixed population. Of the 342 families in the 1917 sample, only 111 were definitely working-class families. One would naturally expect that the energy value of a diet should increase with the demands made upon the physical energy of the consumer, and, unfortunately, the German data are not so presented that a separate calculation can be made of the calorie value in each class. The expenditure on different classes of food is, however, tabulated by occupations, and the differences are not very great. Hence, so far as appears, there is no reason to suppose that the working-class families did really obtain more calories in their diets than the remainder. Still, the possibility must be had in mind.

These objections naturally weaken the force of a comparison which is, however, so far as it goes, satisfactory to us. The decline in total calorie value between 1917 and 1918 in England is of the same order as that taking effect between 1916 and 1917 in German towns, but the absolute level in England is much higher. While the English 1918 average reaches the conventional standard for moderate or sedentary work (the women were mostly light lathe operators), the German result is not much more than what has been deemed a bare subsistence diet.

The consumption of *rationed* fats (of course, the total consumption of fat shown above in the table includes the fat contained in all articles of food) shows that the English hostels were slightly better off in 1918 than the German families more than a year earlier. It seems reasonable to conclude that the position in Germany this year has been still worse than in 1917.

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*The Economic History of Ireland in the Eighteenth Century.* By George O'Brien. viii + 437 pp., 8vo. Dublin and London: Maunsel and Co., 1918. Price 10*s.* 6*d.* net.

An apology is offered by our author for handling here a period treated by historians of such wide fame as Lecky and Froude. Their account, however, was, in the main, political; and economic forces and events, when they were mentioned, filled a minor place in either narrative. Although appropriate passages from their pages appear in the quotations lavishly employed, and the moral urged by Mr. O'Brien lays too much rather than too little stress upon the power exercised by one political factor—that of an independent legislature—on the economic fortunes of his countrymen, we may allow that he has filled a gap. He has done substantial service to the study of economic history by this new exhaustive survey. He has thrown strong light on an important epoch in the past of Ireland; and that office can be recognized without the full acceptance of the conclusions drawn from his scrutiny, or, at any rate, of the application, apparently designed, to present circumstance. For it is surely no felicitous accident on which Irishmen can be congratulated that living Englishmen should be reminded of past incidents beyond recall, for which they can have no real responsibility, as, long since, they renounced the attitude, or reversed the acts, of predecessors they would now agree to blame as severely as their monitors. The memory of ancient grievances inevitably endures; but it is an evil, not a good, hindering and not helping, the wholesome *vis medicatrxi* of time and change. Mr. O'Brien, it is evident, finds it hard, if not impossible, to preserve intact the impartiality to which he properly aspires; and his lapse from the ideal detachment of the historian is due to a wish, or belief, that the accepted past should be interpreted with reference to controversies of present politics.

He first reviews the general economic state of the Irish people in the eighteenth century. He then explores the origin, character and results of what he justly represents as a land-system unhappily begun and disastrously developed. He next investigates the varying fate of the trade and industry of Irishmen at that time, which were, he shows, first severely crippled, or wholly destroyed, by hard subordination to the dominant interests of Englishmen, then, for a short spell of rare prosperity supported, or revived, by the acts of Grattan's Parliament, until, again, the Union with Great Britain dealt another blow, equally unkind, if differently inspired from that originally directed, for weaker rivals were exposed henceforth to "free" competition with stronger business-men. Lastly, he turns his notice to matters of public finance. Dealing in the first four parts successively with the divisions of the subject we have named he devotes a fifth and final part to political influences, to which, as we have said, he gives determining importance. In an Introduction he states his thesis in accordance with this attitude. That, expressed in his own language, may thus be summarized. The period treated—that of the eighteenth century—was distinctly separated by the defined "epochs" of the Revolution and the Union from what went before and what followed after. While Ireland, it must be allowed, "started" the century "with as poor "an economic outfit as can well be imagined"; "all the efforts to "improve her condition were fruitless so long as the power of the "English Parliament prevailed." "The first eighty years" "were "marked by no great economic progress in any direction and in "many respects by economic retrogression." "In the years "1779–82," however, "a great revolution" happened; and the "twenty years which followed were conspicuous for continued "progress towards prosperity." "There is" indeed "no doubt "that, had not Ireland's independence been extinguished, she "would have developed into a rich and powerful nation." But the Act of Union, though it "may, or may not, have been from the "English standpoint a wise measure politically," was certainly "from the Irish standpoint ruinous economically." Pursuing this line of argument Mr. O'Brien not only expands what was lightly touched, or supplies what was altogether omitted, in the story told by the political historians, but he also recognizes that to the end of the sixteenth century the economic tale had been "well" written by Mrs. Green, and that from the Restoration Miss Murray, whose figures he approves and cites, had "admirably" examined the relations, commercial and financial, between England and Ireland. He himself is specially concerned to investigate and answer the contention of Conolly in his "Labour in Irish History" that the burst of economic prosperity just before the Union can be traced to causes which were not political.

The book is then written for a purpose, and it would be idle to pretend that the consequences of this aim have been avoided. Yet admitted facts and the opinions of recognized authorities are used throughout. Few candid scrutineers indeed of the past record of the land systems of Ireland would question their demerits, which were set forth by so able and informed an observer as the economist Cairnes, whose emphatic censure is here quoted. The forced intrusion of English ideas into an uncongenial atmosphere was negatively and positively calamitous. The drawbacks of the relation of landlord to tenant were too apparent and the compensating benefits were not secured. Old tradition was violated and new departure took a mistaken and misleading turn. In actual fact rack-rented cottiers, with no alternative pursuits open to them, fell inevitably into wretched penury, where they did not face, hopelessly, starvation. Absenteeism, middlemen, and the collection of the tithes, were aggravating influences. Nor could it be seriously denied by the impartial bystander that the penal laws, justly reprobated as they have been, affected Protestants as well as Catholics in a manner prejudicial to the economic progress of the country, while no present apologist for Mercantilism would dispute that the application of its principles and practice at this time placed Ireland in a worse position than the Colonies or foreign countries. She suffered in effect from the disabilities of both. She did not enjoy "preferences" granted to the former in the English market, while she was debarred from independent trading with the latter. The indictment on all these counts is grave, and its full restatement in this book is justified. It has not been and cannot be rebutted.

A further step is taken when the author argues that the "primary "cause of the dreadful misery of the Irish people" was "not so much "the use by England of the weapons of the Mercantile System as "the inability of Ireland to use them in retaliation." That "in-"ability" he connects with the "dependence of the Irish Parlia-"ment"; and he urges similarly that in the final twenty years of the period, when, in contrast with the situation found in the previous eighty, power to frame and execute a fiscal policy of its own belonged to Ireland, an agricultural and industrial flow was set in motion that ebbed once more after the Act of Union. The detailed survey of different industries, such as wool, linen, cotton, brewing and provisions, before and during Grattan's Parliament, lends support to the contention; and to corroborate his inference Mr. O'Brien maintains that the Industrial Revolution, to which the temporary advance might be attributed, found no parallel across the Irish Channel. He is certainly successful in showing that the chief signs specified by Toynbee in England of a very rapid growth of population, of its re-distribution between town and country, of great agrarian change and vast and swift improvement in manufacturing processes, did not occur in Ireland, where at any rate the Industrial Revolution did not happen at so early a date. He is on less sure ground perhaps when he draws a sharp distinction between the small effects of former bounties and the decisive result of Foster's Corn Law of 1784 on the use of land for tillage in preference to pasture; and bias may be suspected in his explanation and his measurement of Irish laziness and drunkenness, as, more noticeably, in his handling of the vexed debate on "taxable "capacity" and the financial treatment of the inferior by the superior partner. But, if readers, anxious to frame their own judgment on these and other matters, consult the book, they will find many materials for fair decision. They will at least be rewarded in their search by the pleasure that is imparted by clear arrangement and direct narration. The story is re-told with its appropriate apparatus of abundant fact and copious opinion. Of Mr. O'Brien's competence as an expositor, of his agreeable skill as the special pleader of a cogent cause, and of his industry as an investigator, no listener can feel a doubt. With plain candour an interesting, if melancholy, tale is here unfolded. L.L.P.

2.—*Economic Problems of Peace after War.* (Second Series). The W. Stanley Jevons Lectures at University College, London, in 1918. By William Robert Scott, M.A., D.Phil., Litt.D., LL.D., Adam Smith Professor of Political Economy in Glasgow University. xii + 139 pp., 8vo. Cambridge University Press, 1918. Price 6*s.*

In his first series of lectures Professor Scott aimed at getting a correct general point of view, or attitude of mind, in relation to the problems of the future. In the present series he comes more closely into touch with particular problems. In the first two lectures he treats of subjects with which the statistician, as such, has little concern, viz., the freedom of the seas and of the air, and the effect of a League of Nations upon commercial policy. In the other four lectures he deals with national financial questions in which statistical economics play an unobtrusive but constructive part. "The "Financial burden of today and of tomorrow" is the title of a discussion of the vexed question as to the proportions in which war expenditure should be met by loans and taxes respectively, and after a historical retrospect showing the change in British tradition and views at the time of the South African War, and dealing with the foreign attitude of mind, he reaches the mid position which fairly represents the ideas of prevailing statesmanship—it is the duty of the Chancellor to push taxes to the very verge of that line where they so injure trade as to begin to yield less, or to produce other evils. In the lecture on "Conscription or Proscription of Capital," Professor Scott develops his opposition to the proposal, and in this, with his other writings, has established himself as the foremost spokesman among economists against the levy. His exposition of the confusion of thought which has been introduced by the term "conscription" with its false antithesis between life and wealth leaves nothing to be desired. He shows that the conception does not serve to distinguish real classes, that the element of risk is wholly different, and urges that if logically carried out in the framing of the tax, it would destroy it by honeycombing it with exemptions for the widows and orphans, and for all those adversely affected by sacrifice of life. He develops the usual thesis that it is a bonus upon unpatriotic expenditure, but his treatment is weak in that he does not clearly indicate how far it is worse in this respect than other rival methods of raising money. The treatment is unsatisfactory, too, in that the mere expectation or apprehension of repetition is deemed to be a greater deterrent to accumulation of capital in the future than the immense burden of a *known* income tax, and there is no attempt to analyse the fund of accumulations into its several kinds in order to discover the relative effects of the two kinds of taxation on each class of saving separately. There is no appreciation of the fact that only a small part of the annual accumulation of capital passes under the ordeal of decision whether to save or to spend, and that quite a large part is untouched by the dilemma. That part is quite as likely, or even more likely, to be accumulated when it is only indirectly affected by a possible re-levy, as against an obvious burden of a high income tax. The failure to observe the enormous difference between the springs of motive behind individual saving, and collective or corporate accumulations or company reserves, &c., limits the value of his treatment as a fair and balanced judgment of the case.

In a discussion of the period of financial transition he sketches all the probable shifting economic facts which must follow upon demobilization and reconstruction, and concludes that after two or three years, the peace basis of finance must be reached and firmly made. Much of his matter in these particulars has now passed into the common possession of ideas. He advocates a continuance of the present scheme of excess profits taxation at a lower rate, provided that it can be seen that, in general, demand will outrun supply for a time, and finds additional support for his argument by using that impost as a " corrective " to the private advantages obtained under any scheme of protection by tariff: " if a liberal standard rate of " profit was established, and an Excess Duty levied at between 25 " per cent. and 50 per cent. on the remainder, the public would feel " that there was a considerable compensation for the higher prices " caused by a tariff as affecting the industries concerned." Moreover the attraction of a vested interest in protection would not be so great. His detailed consideration of the immediate post-war position carries, even at this date, considerable conviction. In " Ten Years After," it is assumed that the promised reconstruction of the income tax will have been achieved, and Professor Scott is prophetic as to the changes that will be made. He develops an interesting point leading to the following conclusion: since the happiness arising through wife and children is universally recognised as beyond price, there is no loss of " utility " in the section of income devoted to them, and " it follows that progressive taxation, together " with universal abatements upon the ground of family responsibilities, " cannot be justified. Either may be maintained as parts of alter- " native systems of taxation, but not both together, unless pro- " gressive taxation can be supported on other grounds than the " principle of diminishing utility." He is ingenious in showing that the lower value of securities will lighten the real burden of Estate Duty, for the same *income* will be inherited, under payment of a lower duty than before. He concludes that no comprehensive plan for encouraging saving by means of income tax exemption has been devised which seems likely to be satisfactory, but advocates a stiffer and steeper House Duty, and passes under critical review most of the suggestions that are current for footing the bill. Professor Scott is always suggestive and discriminating. His wealth of literary and classic allusion is at the service of every subject he touches, and if the logical severity of his argument is sometimes a little adversely affected by the distraction or diffusion created by it, there is no doubt that he has the signal merit of humanizing questions which in their abstract treatment repel a wide majority of readers. J.C.S.

3.—*Labour and Capital after the War.* Edited by Professor S. J. Chapman. x + 280 pp., 8vo. London: Murray, 1918. Price 6s.

There is a vague feeling in men's minds that after the war nothing will be as it was before, and anticipation varies from a romantic expectation that the "brotherhood of the trenches" will introduce industrial and political peace to a materialist determination to secure either individualist or socialist domination. Naturally there is a great amount of exploration of the unknown future, and of such work this book is an excellent example. The Bishop of Birmingham, Mr. Clynes, M.P., Lord Leverhulme, Miss Anderson, Mr. R. H. Tawney, Mr. Dudley Docker, Mr. F. S. Button, Sir Hugh Bell, Miss Susan Lawrence, Mr. B. Seebohm Rowntree, and the Editor contribute their views, while Mr. J. H. Whitley, M.P., prefixes an introduction, and the first report of the Whitley Committee is added as an appendix. Four of the contributors were members of that Committee, and its proposals and suggestions necessarily bulk largely in the pages of the book, while Mr. Button, formerly a member of the Executive Committee of the Amalgamated Society of Engineers, gives a well-thought-out and detailed scheme for the application of the Whitley principles of organisation to the engineering industry.

Beyond the connecting link of the Whitley Report there is not much to hold these essays together. It is perhaps common ground that "labour" must not only receive a larger reward in the future, but must also be admitted to an ample share in the management of industry, but there is little agreement on general principles. Mr. Tawney's essay is unquestionably the prominent feature of the volume, and represents the most outstanding divergence from the old ways. An industry, he says, exists to perform a service to the community towards which it thus has rights and duties, and "because its method is association the different parties "within it have rights and duties to each other." "The funda"mental grievance is that the government of industry and the "utilization both of capital and land are autocratic." "If a firm "can introduce into the organisation of its works what changes it "will, if it can alter piece-rates as it pleases without having to justify "the alteration to those affected by it, if it can rearrange processes "and introduce new machinery without the workers being consulted, if it can dismiss whom it chooses without being obliged "to give any account of its decision, it can, in effect, stultify trade "unionism, even while according it a nominal recognition. Thus "interpreted, freedom of management carries with it a control over "the worker which is incompatible with civil liberty." The problem is to create in every industry "a constitution securing its members "an effective voice in its government." Based on a system of trade boards to guard the defenceless members, development must proceed through trade unionism to "the creation in the staple industries of permanent National Councils of employers and workers, "together with the establishment of district and workshop committees in different districts and in individual workshops." At first the powers of the workmen will be critical rather than constructive, but the way will be opened to "a radical transformation "of industrial relationships. . . in substituting a relationship of "co-ordinate service to the community for the present subordination "of the hired wage-earner to a master who employs him for profit." "For charges which are in the nature of economic rent, or monopoly profits, or which are made merely because one party in "industry is in a strong position to corner the market or to drive a "bargain, there is no more moral or economic justification than "there was for the *lods et ventes*, or *banalités*, or *vingtaines* of the "old *régime*." This leads ultimately to the public ownership of land and capital.

Turning to the views of employers, Lord Leverhulme also strikes the note of "service," and hopes by a six-hours' day and a system of co-partnership to secure for the worker greater leisure, less strain, more income, and better opportunities for education. Sir Hugh Bell points out that increased production is the indispensable preliminary to larger incomes for the working classes, but the cogency of his proof is little likely to make the man with 25*s*. a week tolerate the man with 25,000*l*. a year. Mr. Dudley Docker expects increased competition, which can only be met by new methods whose successful introduction depends on better relations between capital and labour. He attaches much importance to improved housing and better education, and holds that when labour is displaced by machinery "the first claim against such "increased output should be the support of displaced labour until "that labour has been reabsorbed."

Miss Anderson and Miss Lawrence give instructive accounts of the development of women's labour during the war, and the latter puts in a strong plea for trade boards. H.W.M.

4.—*Wool*. By Frank Ormerod. (*Staple Trades and Industries*. Edited by Gordon D. Knox,) 218 + xii pp., 8vo. London: Constable: Price 6*s*. 6*d*. net.

We have enjoyed reading Mr. Ormerod's book, and we are pleased to be able to testify to the information pleasantly contained within its covers. We expected a pleasure when, remembering Mr. Ormerod's intimate knowledge of the industry and his welcome personality, we settled down to read and criticise, and we were not disappointed. What the every-day reader wants to know about wool, Mr. Ormerod tells him in plain and direct and clear language intelligible even to "babes in these matters." Yet—what a little is told compared with the things some people need to know at the present moment! Mr. Ormerod tells in easy picturesque fashion the history of the settlement and growth of woollen manufactures in England; of wool producing in Australia; of classing, baling and marketing; he makes clear the distinctions between merino and crossbred, and tells how and why the latter has been produced: he explains the mechanical processes of topmaking, worsted and woollen spinning, weaving, and "finishing"; and for all these things, albeit they have been told before, we thank him. Young England can never be told too frequently how the oldest and still one of the greatest of her industries has been built up.

Yet—what a lot of things Mr. Ormerod does not—cannot—tell us! And, what a lot of these things it is imperative for somebody to know!

We are now faced with the after-war difficulties of fairly rationing the world—and particularly Europe—with wool wherewith to return to civilian trade. During the war the consumption of wool has been enormous—in countries where it could be obtained—yet curiously uneven. To-day Britain owns a huge proportion of the world's stock of wool, but it is at the other end of the globe, and shipping has yet to be freed to bring it where it can be spun and woven. Nor unlikely is it that wool will play a part in the peace negotiations; at any rate, as the Wool Council can testify, it is playing a part in certain international relations already. How then can we assess the claims put forward by the Allied Nations? and what may we, for various reasons, have to provide or allow the enemy nations with whom peace has yet to be made? How large is the wool textile industry in each country? and what proportion of the needs of each in raw material can be provided from its domestic clip? These questions we, in common with many others, have had to consider lately, and we turned to Mr. Ormerod's book for guidance. Shall we test it by the pre-war consumption? Mr. Ormerod gives, at pp. 66 and 67, two statements, which we will set side by side.

	P. 66.	P. 67.
	Consumption of wool in million lbs.	
U.S.A. 1909–10	588	505
U.S.A. 1910–11	451	
United Kingdom	490	515
France	460	480
Germany	380	400
Austria-Hungary	—	140
Italy	—	60

and again at p. 67 he gives the consumption in the United Kingdom at 590 millions. We confess we cannot make these figures "tie "up." Are they "greasy," or "clean" wool? What about Belgium? and what about Russia? Apparently the figures given at p. 66 are the "latest available" and those at p. 67 are the estimates of post-war requirements for normal full-time running. Apparently, again, they are a compound of greasy and scoured, and have to be "appraised" before the quantities of "clean" wool can be estimated. The fact is that before the war we knew little about the consumption, production, machinery, and personnel of the industry in any country, and that to-day we only know much of a surety about our own. We know, for instance, that about 35 million lbs. clean per month has been required to run our industry during the past twelve months; that this is on a rationed civilian basis; that army goods are much heavier and consume much more wool per spindle than pre-war civilian goods; and that the hosiery trade of the Midlands, working up to 90 per cent. on heavy military goods, has had to be supplied from Yorkshire instead of from Belgian and German spindles. We have done it—to our own marvel when we look back on it. But the lesson for the moment is that somewhere about 33 million lbs. clean wool, or 400 million lbs. per annum, at roughly 58 per cent. yield, or 690 million lbs. greasy will keep the spindles of the United Kingdom going.[1] We do not know what is required, on the same basis, for any other country. How many spindles have they? How many looms? How many employees? Mr. Ormerod does not say, and we do not know. An official estimate of the spindles of the United States of America exceeds by a million the number recorded by the Association of Woollen Manufacturers. Is the discrepancy genuine or does the official estimate include "twisting" spindles, which as everyone knows are not consuming spindles at all? Again we cannot tell.

In sober truth the statistics of the trade are lamentably wanting. The statistics of the Home Office survey of textile factories are fourteen years old, and it is known that while hundreds of looms in Bradford, Keighley, and Silsden have gone from wool-using to cotton-using (the one being rationed and the other free) there are more looms to-day in the trade than then. Mr. Ormerod gives 70,000 as the number of persons employed in the woollen trade of the United Kingdom, and 190,000 in the worsted branch, all in Yorkshire. It is a good guess, but that is all. And so we might go on. Mr. Ormerod certainly tells us more than any recent writer —and tells us all he could find out, but it is precious little compared with what we want and need to know. When will the Board of Trade, or the Ministry of Labour, give us some real surveys of the main industries, at home and abroad?

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[1] Possibly this is based on too high a usage of wool in the woollen branch of the trade. If so, perhaps 30 million lbs. clean a month, 360 million lbs. per annum, or about 620 million lbs. greasy would see us through.

And now, having thanked Mr. Ormerod for what he has done, and pointed out what he couldn't do, let us end by pointing to a slip or two.

At p. 10 he speaks of "something more than the baits said to "have been held out by the historian Fuller" when he means that Fuller said they were held out. At p. 32 he says "and, despite "the progress in machinery, even to-day the best and most durable "woollen materials are made by hand." We ask, Where? At p. 48 he makes unqualified the statement that "woollens . . . "are many times heavier and bulkier than worsteds," when he means that *on the average* they are so. Some worsteds are heavier and bulkier than the average woollens, by several ounces to the yard. At p. 51 the statement that during the war "Not only was "there a call for every available pound of wool sheared since the "war began, but old stocks were drawn upon to their utmost limit" gives the wrong impression. It is true in Europe, but the stock of wool in Australia, &c., is enormous. At p. 51 he uses the phrase "totally inadequate," which, if we understand it, means literally that in this connection there was no shipping at all! Mr. Ormerod means "very inadequate."

But these are small blemishes, easy of correction when a new edition is called for, as it will soon be if the book gets the sale it deserves. G.H.W.

5.—*Use of Factory Statistics in the Investigation of Industrial Fatigue—A Manual for Field Research.* By Philip Sargant Florence, M.A., Ph.D. (A separate issue of vol. lxxxi of *Studies in History, Economics and Public Law*, issued by the Faculty of Political Science of Columbia University.) 153 pp. 1a., 8vo. New York and London: P. S. King and Sons, 1918. Price $1 25 cents.

This volume deals with a subject of the highest importance, The study of industrial fatigue absorbed much of the time of the Health of Munitions Workers Committee during the War, and a new authority has now been constituted and entrusted with the expenditure of a considerable sum of public money upon furthering our knowledge of the subject. Some investigators have already been appointed, and in the near future a large staff will be engaged in the elucidation of a cardinal problem of industrial organisation; consequently a demand exists for guides to field work. Dr. Florence, who was for some time a member of the Health of Munitions Workers Committee's staff and has since filled a similar post in America, has had considerable practical experience of research work, and his book contains a good many useful hints for the beginner and valuable warnings as to the pitfalls which yawn at the feet of the unwary. He rightly insists upon what he terms the ambiguity of records and gives several helpful illustrations from his own experience. His chapter on "The Output "Rate" deserves praise in this connection.

While we think that most investigators would derive useful instruction from Dr. Florence's book, we cannot honestly say that it is a very good one. Although the title introduces the word statistical, statistical aspects of the subject are dismissed in the fewest possible words, the reader being advised to obtain the needed information in "any elementary manual of statistical theory." *En revanche*, Dr. Florence continually indulges in language which reminds us of Macaulay's criticism of Gladstone. "He has one gift most dangerous 'to a speculator, a vast command of a kind of language, grave and "majestic, but of vague and uncertain import." The explanation is that Dr. Florence has attempted too much and been led to write about matters which he has not yet had time to study adequately. This is especially obvious in the sections devoted to Occupational Mortality Rates and the Measurement of Labour Turnover, respecting which subjects Dr. Florence is a very unsafe guide; the interpretation of occupational mortality rates is undoubtedly a difficult task, but the valuable literature is more extensive, and the conclusions therefrom more important than the readers of this work would suppose.

We do not wish to part from a young investigator whose zeal deserves encouragement in any spirit of hostile criticism, and we shall look forward with interest to future contributions from his pen. M.G.

6.—*Postal Savings: an Historical and Critical Study of the Postal Savings Bank System in the United States.* By Edwin W. Kemmerer, Professor of Economics and Finance, Princetown University. viii + 176 pp., 8vo. Princeton, N.J.: University Press; London: Milford, 1917. Price $1·25 net.

The postal savings system of the United States was created in 1910. At that time there were existing 11,000 national, state, and other banks "carrying" the savings of 15,000,000 depositors, amounting to more than 1,000 million pounds sterling. By the Postal Savings Bank Act the interest allowed to depositors was fixed at 2 per cent., little more than half the average rate allowed by other banks. At the latest return available to the author (1916) the number of post offices open for savings bank business was 8,421. That the deposits in many of them are as yet small leads him to infer that there is "ample room for the use of the pruning "knife." Instead of the pass book a certificate is issued in an envelope. Deposits were to be made only in sums of $1 or a multiple thereof, and no person was to deposit more than $100 in a calendar month or $500 in the whole. On June 30, 1916, the number of depositors was 600,000, the amount deposited 17 million pounds sterling. On May 18, 1916, the monthly limitation was repealed, the interest-bearing limit raised to $1,000, and authority given to receive deposits, not bearing interest, up to another $1,000. This authority had not been acted upon when the author wrote. In the investment of the funds, there is a noteworthy divergence from the English system. Not less than 65 per cent. of the total deposits is to be kept in solvent banks, to bear interest at not less than 2½ per cent., and to be secured by deposit of public bonds or other securities supported by the taxing power.

The author's critical study of the results is made at too early a stage in the history of the system, and is likely to be qualified by subsequent events. The time for a general review of the subject will hardly arrive until the disturbing effects, if any, produced by the entry of the United States into the European war have ceased to operate, and the work of Savings Banks has resumed its ordinary course of progress. In appendices are set forth the text of the Acts regulating the Postal Savings Bank in the United States and in the Philippine Islands. A good index is given. The work contains much information of interest as to the early procedure under a system which differs in many material points from that in existence in this country. E.B.

7.—*Proceedings of the Conference on Social Insurance Called by the International Association of Industrial Accident Boards and Commissions, Washington, D.C., December* 5 *to* 9, 1916. [Bulletin of the United States Bureau of Labour Statistics, whole number 212.] 935 pp., 8vo. Washington, D.C., Government Printing Office, 1917. Price 60 cents per copy, for "additional copies procured from the Superintendent of Documents, Government Printing Office."

The Governors of 13 States appointed 58 delegates to this important conference, and altogether about 250 persons representing various interests concerned in the subjects debated were registered as members of it. The President of the United States attended one of the meetings to bid them "a very genuine welcome" and the Secretary of Commerce, the Secretary of Labour, Mr. Samuel Gompers (President of the American Federation of Labour) and Col. George Pope (President of the National Association of Manufacturers) delivered addresses at the same meeting. The subjects discussed were 1. Workmen's Compensation; 2. Sickness (Health) Benefits and Insurance; 3. Invalidity and Old Age Insurance, Pensions, and Retirement Allowances; 4. Maternity Benefit and Mothers' Pensions; 5. Unemployment and Savings Bank Insurance.

Upon the subject of Workmen's Compensation, a paper was read by Mr. G. A. Kingston on the Ontario System of Workmen's Compensation. He stated that there was no minimum provision, but that in fixing the amount of compensation, wages in excess of $38·46 per week must not be considered. This restriction applied in very few cases, as the average wage of workmen was only one-third of that amount. The other papers related to compensation in the United States, which is regulated by local State laws.

The subject of Health Insurance was considered from several points of view. Existing agencies were described, and proposals made for legislation. The importance of adapting sickness insurance to the case of women workers was urged. It was contended that health insurance should be universal but not compulsory—a condition very desirable, but not easily obtainable. With regard to the medical service, Dr. Robinson strongly criticized the English system. The system of group insurance (referred to by Mr. Geoffrey Marks in his recent presidential address to the Institute of Actuaries) was described and strongly commended.

Old age pensions, under existing methods, are the creation of individual establishments. After discussion of several of these, proposals for compulsory invalidity and old age insurance pensions and retirement allowances were considered. Our non-contributory system was criticised, and it was argued that its application to the requirements of the United States would cost 114 million pounds sterling per annum. On the other hand, the difficulties of a contributory system were urged.

The chairman of the meeting which discussed maternity benefits and mothers' pensions said truly that such a conference could not have been held a quarter of a century ago, and that it marked real progress in the consideration of social reforms. Experiences in the administration of mothers' pensions were stated under the New Jersey Act of 1913, the New York Act of 1915 and the Illinois Act of 1911.

The British National System of Unemployment Insurance was a special subject of discussion. It was commended by Mr. Bruno Lasker and by Miss Olga S. Halsey. The Massachusetts system of Savings Bank Life Assurance was described. It has been adopted by four of the savings banks in that State, which contributes $20,000 to the support of the movement.

Though subsequent events in the United States and in Europe will call for the reconsideration of many economic questions, the collection of so comprehensive a body of expert opinion on matters of general interest will continue to be of great value. The Conference wisely refrained from formulating any definite resolutions, its function being that of discussion only. E.B.

8.—*The Iron Circle.* By S. Herzog. Translated by M. L. Turrentine. 280 pp., small 8vo. London: Hodder and Stoughton, 1918. Price 6*s.* net.

This frank ugly "plan to dominate the trade of the world" was drawn up in 1915 for "home consumption" by an "eminent German "engineer and economist." It has been published, for the warning of its intended victims, by the United States Food Administration. The scheme is ingeniously devised, and the publishers are not, we think, mistaken when they describe Mr. Herzog as the "Trade "Bernhardi." We may also hope, perhaps, that that writer's prophesied alternative of "world conquest or downfall" for his country, as the result of the "next war," may find fulfilment in her economic destiny parallel to the fate which has already, it would seem irrevocably, befallen her on the battlefield. The beliefs avowed and the practices recommended by the two authors are not dissimilar, and they reflect alike the extravagant fondness for grandiose theory laboriously developed, the amazing self-conceit shown in the confident assertion of their complete superiority to other nations, and the strange perverse misunderstanding of the temper and foolish depreciation of the capacities of possible, or probable, competitors or foes.

The plan of business operations to be followed subsequently to the war by German traders is methodically presented here in successive chapters. Their mere headings are instructive. "The "grand strategy of the German offensive," "forging the thunder-"bolt," "the organisation of the German export army" and "the "export army in action" serve to indicate in its aggressiveness the tendency of Germans to conceive of trade as analogous to war, to be won or lost by dexterous or inept tactics and strategy. Others, like the "camouflage of commerce," the "Chinese wall of secrecy," "diplomacy, the advance guard of the export army," and the "denationalisation dodge, an antidote to hatred," similarly illustrate an ingrained instinct to employ in business, as in military and naval conflict, all kinds of arms and various devices, new and old, illegitimate as well as lawful, cruelly barbarous no less than astutely civilised, to advance their aims; and with chicanery and duplicity they subordinated throughout the means to the end. "The discipline "of labour," "a feudal system of commerce," "the hereditary "workmen of combined industries" and the "curb on capital," as descriptions of remaining sections, confirm the analogy suggested, and are used to demonstrate the justified confidence of our author that masters and men in the "Fatherland" could be ordered according to the wishes or the whims of the government, and were sternly drilled to obey without demur their civil authorities, and, above all, their military officers. An introduction explaining the probable situation of German export trade after the war when it will be, it appears, exposed to the hatred, tacit or avowed, of a world of foes, is followed by discussion, under the titles mentioned, of the various factors, foreign or domestic, which will influence or control exports. They are ten in number and comprise the "adaptability," which should be increased, of export trade, the "attitude," which must be moulded, of "foreign countries," and "emigration," which needs severe restraint, of "domestic industries." "Economic compensa-"tions," "State protection," "industrial protective unions," "com-"mercial treaties," "ways of denationalising German goods," the development of "competitive ability" and the proper growth and use of "capital," would also be invoked in their fitting sphere and in suitable degree.

Mr. Herzog regards hostility on the part of other nations towards German goods as likely or certain, and he holds that this grave impediment should be met by the open exertion of brute force or the deft use of plausible deceit. It must be overthrown and destroyed, or German traders must be able to pass round it. By what means can this necessary work, he asks, be done? His answer is that some articles, which Germany alone can furnish, or control, or provide in the shape and at the cost desired, will still be "indispensable" to the foreigner; and by foul, if not fair, means such need should be employed to ensure the entry and preserve the dominance, as before, of German trade. By circuitous, if not by straight, paths the desired goal can be reached. At home some trades may be helped in various ways, while others must be asked, and will be expected, to submit to suitable restraint, or to suffer disability or loss, through such means as an embargo or the like, receiving in due time compensation, it may be, from funds centrally administered and fed by sufficient contributions equitably raised. If the enemy's submission cannot be secured by treaty regulation or by the infliction of other acknowledged disadvantage, the baffling falsification of trade marks or the disguising intervention of friendly neutrals should be invoked to deceive him and make him buy, willy or nilly, German commodities as of yore. German employers and employed, under strict official orders, with the aid of State protection or of systematic dumping, will thus effect a breach in the "iron circle" that threatens to surround them and exclude their export industry from privilege or opportunities once enjoyed.

Such is the monstrous theme congenially developed along the lines which we have sketched, and editorial notes prefixed to each chapter, "summarising the contents and noting the interesting "points," help us to "visualise, and more fully realise, the significance "of the text," written, as that is, "in the true Teutonic style." The book is, indeed, essentially Teutonic, in spirit as well as form. It reflects what Mr. Hoover and his American colleagues rightly term the "insolent disregard of the rights of others," and the facile unabashed "resort to deception," which have been typical of Prussia and of Prussians since the days when Frederick the Great ruled them successfully. The "entire conception" depends on fraud, and it hinges on "super-selfishness." It is, indeed, "commercial rapine" which is contemplated. Yet the "world conquest" plotted for two generations past by Germany was similarly conceived in "terms "unknown or little understood" by other countries; and "well-"organised," "systematic espionage," with "insidious propaganda," had been a feature of her trading acts and of her "peaceful penetra-"tion" before the war. The war itself, conducted in no different a mood of callous, determined ruthlessness, had, it is believed with reason, commercial motives at its back, mingled with other influences; and the supremacy of the State, with the subservience of the masses to the ruling classes, was carried into industry and trade as well as into general politics. To be forewarned, however, is, we may hope, to be forearmed; and this last menacing project, "carefully thought out," openly "breaking with all business ethics," and promising to "stop at nothing," from "national dumping" to "false labels" and "breach of contracts," which appeared in 1915, has, through the useful offices of the United States Food Administration, been now made known to the manufacturers and bankers, the professional men and the labouring classes whom it threatened to assail and overcome. Let them then take heed in time. Let them not be caught unprepared, as their countries were by war. Such is the moral which the editors enjoin.

The position to-day, no doubt, differs somewhat from that of 1915, but the admonition may still be opportune. The confident belief of the author that Germany, victorious in war, could impose her own terms for the supply of necessary raw materials to herself, or for the enforced receipt by her enemies of her manufactured goods, by clauses in commercial treaties, is no longer tenable; for the arbitrament of battle has gone decidedly against her. Through the compulsory surrender of territory, which now seems certain, she may even lose effective or monopolised control of such "indis-"pensable" goods as the potash which he mentions. But the guile and fraud hinted by him as means to circumvent the unwillingness of foes, defeated or triumphant, to buy obnoxious articles may still be practised; and the unwearying industry and elaborate pains, which have notoriously been characteristics of a servile and much-governed people, may not depart when they are rid of their autocratic rulers and of tyrannical military discipline. They may remain formidable traders when they have ceased to be invincible soldiers. This forcible, if unpleasant, book should therefore be properly treated, not simply as the ugly exhibition of a passing negligible policy, but as a plain signal of serious abiding danger that demands quick and full attention. L.L.P.

9.—*Russia: Its Trade and Commerce.* Edited by Arthur Raffalovich. x + 461 pp., 8vo. London: P. S. King and Son, Ltd., 1918. Price 12*s.* 6*d.* net.

Problems Confronting Russia. By Baron A. Heyking. xvi + 219 pp., 8vo. London: P. S. King and Son, Ltd., 1918. Price 10*s.* 6*d.* net.

These two volumes, by distinguished Russian authorities well-known in this country, have a common purpose—that of helping to dispel the still widespread British ignorance as to the character, organisation and resources of the vast area and varied peoples which constituted the Russian Empire. But with this common purpose they differ in character. The volume edited by M. Raffalovich is avowedly a compilation intended to give "a reliable description of "Russia, its agriculture, forests and mines," and a concise description of "the Russian organisation of credit, monetary system and "financial administration." The work of the former Russian Consul-General in London, though it contains a lengthy chapter on the economic resources of Russia and Anglo-Russian trade relations (extracted from a Paper read before the Royal Statistical Society in January, 1917) is otherwise a collection of essays and articles reprinted from a number of publications and intended to form as a whole "an appreciation of the evolution of Russia," an interpretation of the Russian character in its various manifestations, and a contribution towards the promotion of an Anglo-Russian understanding. M. Raffalovich's volume was ready at the beginning of 1917: Baron Heyking's volume contains essays on such recent subjects as "the degeneracy of the Revolution" and "Bolshevik political "economy." The note of optimism which runs through the first of the volumes before us as to the future economic development of Russia is nevertheless repeated by Baron Heyking, who asserts that "there is no room for despondency as to her future."

The value of M. Raffalovich's volume has inevitably been affected more severely than that of Baron Heyking's essays by the events of the past two years. It is obvious that the revolution and its sequels may make the chapters dealing with public finance, money and credit, and the law relating to joint stock companies, of little more than historical interest. Apart from this, however, the volume brings together a very large amount of detailed information, statistical and other, as to Russia's trade, production, transport and economic resources, which is of permanent value and should be of substantial help to those who may seek to develop trade relations with that country, or group of countries, when a measure of order and stability is once more attained there. Our only regret is that the volume has not received more careful editing and that fuller explanations have not been given on a number of points.

Its utility would have been increased, for example, if the equivalents of the Russian weights and measures (in which all the statistics are set out) could have been given at the outset: the British reader, we fear, will not readily appreciate statistics of traffic in "thousands of poods per verst," or land areas in "dessiatinas" (spelt in three different ways on pp. 21, 62 and 70), or reservoir contents or standing timber in "cubic sagenes." In the second statistical table on p. 44 (which relates to the export of animal produce, and poultry produce as part thereof), the percentages for 1911, 1912 and 1913 appear to be inaccurate, whilst the succeeding sentence is not easily intelligible. On p. 46 is the following sentence: "In 1894 our exports amounted to "954,900,000 eggs, whereas now they reach 3,396,859,000 eggs, an "increase from R. 39,000,000 in 1902 to R. 90,600,000 in 1913." It is not clear why the starting point in this comparison should for quantity be 1894, and for value 1902; and, apart from this, it appears from the table and comment on p. 47 that "now" in the sentence quoted refers to 1912 and not to 1913, when the quantity was much greater. A phrase such as the following in the section on tobacco (p. 79): "Of the total export of 640,000,000 poods (?) "(40,000 poods?) of cigarettes in 1911"—leaves the reader in a state of some uncertainty. Incidental errors we have noted are in the first percentage on p. 43, where "33" should be "50"; wrong page references on pp. 274 and 302; and on p. 320 the title of an article in the *Economist* appears as "Our Need of *Prussian* Pro-"duce." A more serious criticism is that it is by no means always clear what area is covered by the statistics given, especially as to whether Finland is included. From the references to Finland on p. 15 this might or might not be the case; but on p. 49 Finland appears as a country to which poultry is exported, no reference to Finland is made in the chapter on Russian Foreign Trade, whilst in the chapter on Factories and Workshops it is definitely stated that the statistical data given do not cover Finland. The discussions of the position as to various branches of production are generally interesting, but it would have been useful if the account of cotton growing could have included some description of the grades produced, and the wool production of Russia (which contributed before the war some 40 per cent. of the world's output of "low" wool) is dismissed in a very summary manner. Finally, the ordinary reader is sometimes credited with more knowledge than he is likely to possess: *e.g.* (p. 15) "In distributing the population of Russia "(exclusive of Finland), according to classes, we find, to every "thousand inhabitants, 771 peasants, 107 burgesses, 66 aliens. "23 Cossacks, 15 nobles, 5 clergy, 5 honourable citizens." Most of the terms used in that sentence need definition, and one is left to speculate as to the position of the remaining 8 per 1,000.

We have drawn attention to these various points, not as detracting from the merits of M. Raffalovich's volume, but simply in the hope that the opportunity of a new edition may be taken to carry through a revision which would enhance its already substantial utility.

Baron Heyking's volume of essays, as we have already indicated, in the main is not of a kind which lends itself to detailed review in this Journal. A mere enumeration of such chapter headings as "Racial and Religious Tolerance," "A Plea for Russo-British "Intellectual Coalescence," "The Interests of Posterity," "The "Difference between the English and Russian Point of View upon "Duelling," is sufficient indication of the fact. We can only record the interest and appreciation with which we have read the book; our sympathy with the author's gallant defence of his country, especially in the final essay, "Pro Patria," which concludes with an impassioned defence of the late Emperor; and our hope that his unwavering faith in the future of Russia may be abundantly justified.

P.A.

10.—*Other New Publications.**

Bauer (*Stephan*). Arbeiterschutz und Völkergemeinschaft. 160 pp., 8vo. Zurich: Art. Institut Orell Füssli. 1918. Price 7 francs.

[A Study on the International Labour Movement, and its possible developments in the direction of greater protection for industrial workers. The book is in twelve chapters, with three appendices, and its author is a Professor at the University of Basle, and Director of the International Labour Office.]

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* See also "Additions to the Library," page 127, *sqq.*

Cohn (*Herman*). Capital To-Day. A Study of recent Economic Development. 2nd edition. xii + 376 pp., 8vo. New York: G. P. Putnam's Sons, 1918. Price 10*s.*

[The first edition of this book was reviewed in the *Journal* for March, 1916, and apart from one section of the book, only slight changes have been made in the present edition. This section, "Money of Account," the author states was no longer adequate owing to the economic importance suddenly attained by bank-made credit money. A more systematic analysis of the categories of bank money, of their relations to each other and to social solvency, has necessitated the re-writing and enlargement of this chapter.]

Dixon (*Frank H.*) and *Parmelee* (*Julius H.*). War Administration of the Railways in the United States and Great Britain. (Carnegie Endowment for International Peace.) x + 155 pp., 8vo. New York: Oxford University Press, 1918.

[This report was issued towards the end of 1917, and is divided into two parts, the first dealing with the United States and the second with Great Britain. As this country took over the railways from the beginning of the war, the English record is much longer than that for the United States. The British organisation had been in existence since 1896, and the account given by the authors shows that a high degree of efficiency was attained. They do not claim that the account is complete, as, owing to war conditions, much information was not obtainable. As no preparations to speak of had been made in the United States for railway participation in war, except within a few months of their entering the war, the report deals mostly with the working of the railways before they were taken over by the Government. There are several appendices and an index.]

Glasson (*William H.*). Federal Military Pensions in the United States. (Carnegie Endowment for International Peace.) xii + 305 pp., 8vo. New York: Oxford University Press, 1918.

[This book gives a general and complete account of the United States Pension System since its inception to the present time. Prof. Kinley, who edited the volume and contributes a preface, claims that the survey is impartial and thorough, and enables one to judge of the effects of such a system on the civil and political life of a democracy. The story is both heartening and depressing, the latter owing to the political corruption that crept into the administration of the pension system, the pensioners, assisted by political leaders, becoming so numerous and powerful that for a time they held the balance of political power. The new system of pensions introduced when the United States went to war with Germany is fully described. There are numerous statistical tables and an index.]

Hecht (*J. S.*). A Challenge to Economists. 44 pp., sm. 8vo. London: P. S. King and Son, 1918. Price 2*s.*

[The author is opposed to a free trade economic policy, and numbers the 91 paragraphs or points of which the pamphlet consists, presumably to facilitate a reply to his challenge.]

——— Free Trade or Free Production. 20 pp., 8vo. London: P. S. King and Son, 1918. Price 6*d.* net.

[Also in opposition to Free Trade, though the author admits that at one period it was beneficial to the country. He contends that changes in the fiscal system of this country would lead to increased home production and improved well-being of the country generally.]

Kirkpatrick (*F. A.*), M.A. South America and the War. vii + 79 pp., 8vo. Cambridge University Press, 1918. Price 4*s.* 6*d.* net.

[This book is based upon a course of lectures given by the author at King's College early last year. The object of the course was to draw attention to German activity in South America, and particularly to their efforts to hold their economic position during the war, with a view to its extension later on the return of peace. Another object was to examine the bearings of the war on those countries, and the influence of the present crisis on their development and world status.]

Lees (*Edward O.*). National Debt and its Reduction. 8 pp., 8vo. Manchester, 1918.

[Suggests the issue for sale of income-tax redemption certificates in a series of various denominations, and at prices based on the conditions prevailing at the time, exempting the holders for a certain period from payment of income-tax amounting to a given sum per annum.]

Leverhulme (*Lord*). The Six-hour and Other Industrial Questions. With an Introduction by Viscount Haldane of Cloan. Edited by Stanley Unwin. xv + 331 pp., 8vo. London: George Allen and Unwin, 1918. Price 12*s.* 6*d.* net.

[A selection of addresses given by Lord Leverhulme on different occasions dealing principally with industrial questions, more especially co-partnership and the six-hour day. As regards the latter, the two essays dealing with this question have been specially written for the volume, and represent Lord Leverhulme's considered views on this subject. He considers it feasible, and a practical and necessary step in the reconstruction after the war. The subjects of housing and social welfare; education, business management, and industrial efficiency are also dealt with. The book is very readable and adequately indexed.]

Litwinski (*D. L.*). Polish Currency Problems. 7 pp., 8vo. 1918.

[A reprint from the *Economist* of an article by the author, showing how the Germans by artificial manipulation of the rouble in relation to the German mark, have tried to get into their own hands the economic future of Poland.]

Macara (*Sir Charles W.*), Bart. Social and Industrial Reform. vi + 207 pp., 8vo. Manchester: Sherratt and Hughes, 1918.

[The book is composed of a number of articles on economic and industrial subjects contributed recently by the author to various journals, and which he was urged by readers to place on permanent record. Among the subjects discussed are the conscription of wealth, industrial reconstruction, man-power and industry, and several phases of the cotton industry. There are several appendices and an index.]

Munro (*Dana C.*). The Five Republics of Central America. Their political and economic development and their relations with the United States. (Carnegie Endowment for International Peace.) xvi + 332 pp., 8vo. New York: Oxford University Press, 1918.

[This book has been written more especially for the American public, though it is also hoped it may be helpful to the people described. It is a careful study of the economic and political conditions of the republics in question, and the author has made good use of the material available. He remarks on the difficulty of obtaining satisfactory statistical data, and supplemented his studies by several months of travel over the countries described. The book is divided into fourteen chapters, and there is a bibliography, an index and map.]

Newcomer (Mabel), Ph.D. Separation of State and Local Revenues in the United States. Studies in History, Economics and Public Law, edited by the Faculty of Political Science of Columbia University. 195 pp., 8vo. 1917.

[This dissertation deals with a problem which is peculiarly American, viz., the necessity for securing a system in which State and local revenues are derived from wholly independent sources, which usually means that no State tax should be levied on general property, but that State revenue should be obtained from special classes of property exempted from local taxation. Such a division takes the form in California, for example, of the reservation of corporate property for State taxation, and the property of natural persons to the local division. After dealing with the theory of different types of separation which have arisen often through the failure of the general property tax, the author devotes a separate chapter to the evolution of separation in the several states. Her main conclusion is that the process of separation of source has greatly improved State finance, but has done nothing to make local administration more efficient. It has no unique virtues, but represents a transitional stage in progress.]

Neymarck (Alfred). Les Milliards de la Guerre. 32 pp., la. 8vo. Nancy: Imprimerie Berger-Levrault, 1918. Price 4 francs.

[A statistical study of the financial issues involved in the war, based on a study made by the author in the early seventies on the indemnity paid to Germany by France after the war of 1870-71, showing how the money was then obtained and its economic effects on the two countries involved.]

Nicholson (J. Shield). War Finance. 2nd edition. xxxii + 504 pp., 8vo. London: P. S. King and Son, 1918. Price 12*s.* 6*d.*

[The first edition of this book was reviewed at length in the *Journal* for March, 1918, and the author in the present edition remarks that no changes that have occurred in the general financial situation since the issue of the first edition affect its main argument and conclusions. Three new chapters have been added; the first deals with "Bolshevism," and the second describes the continued abnormal increase in the various forms of token money, notes and credit. The third new chapter deals with the payment of war debt by the taxation of capital, and shows the dangers and difficulties of the proposed "levy on capital." In conclusion the author remarks that if the book is pessimistic in parts, it is due to his fear that money interests and mismanagement may prevail over moral duty.]

Rae (George). The Country Banker . . . By the late George Rae. With an Introduction and Notes by F. E. Steele. New and revised edition. xxi + 324 pp., 8vo. London: John Murray, 1918. Price 6*s.* net.

[Mr. Rae was a well-known authority on banking, and the several editions of this book which have appeared since it was first published in 1885 indicate the extent to which it has been read. Mr. Steele, in his introduction, calls attention to certain developments in the English banking system since the book was written, especially in regard to banking in its international relationships and foreign exchange business, but on the whole the book will be found as applicable to present-day banking conditions as to those of the past. Mr. Steele has added brief notes here and there where points in the book called for revision.]

Rothband (Henry L.). The Rothband Employment Scheme for Sailors and Soldiers Disabled in the War. Parliament to the Rescue. 34 pp., 8vo. September, 1918. (Privately printed.)

[This is the third pamphlet by Mr. Rothband, and describes the formation of a Parliamentary Committee of both Houses to consider his scheme and discuss in somewhat more detail than has hitherto been possible the machinery for putting the scheme into operation.]

Sanders (*William*). The Law and Practice of Excess Profits Duty. 2nd edition. xii + 276 pp., 8vo. London: Gee and Co. Price *6s. 6d.* net.

[The high rate of the Excess Profits Duty makes its imposition one of unexampled financial effect, and the author hopes that this second edition of his book will facilitate correct assessment. The Duty, it is stated, is noteworthy from a taxation point of view, for its equitable reliefs, and there is a real disposition on the part of the Revenue to meet equitably any technical point of hardship.]

Smith (*E. J.*). Race Regeneration. xii + 223 pp., 8vo. London: P. S. King and Son, 1918. Price 7*s.* 6*d.* net.

[The author, who is chairman of the Bradford Health Committee, strongly urges the necessity of improving the social conditions of the people, especially in towns. He is in favour of a Ministry of Health, which would focus and co-ordinate the work of the different public health services at present in existence. The declining birth-rate is also discussed, and the necessity for the extension of maternity and child welfare institutions. There are also chapters on housing, the standard of family life, and a clean milk supply. The author's practical experience as to the conditions existing in Bradford in regard to these matters gives an additional value to the book. There are numerous illustrations, not always happily placed, such as the two pictures of the Odsal Sanatorium Piggeries in the chapter on Housing.]

Smith (*J. Grove*). Fire Waste in Canada. Commission of Conservation, Canada. vi + 319 pp., 8vo. Ottawa, 1918.

[A careful investigation of the losses of life and property from fire in Canada and of the possibility of their reduction. These losses in Canada are greater *per capita* than in any other country of the world, and are an enormous and increasing drain upon the resources of the Dominion. A series of conclusions to lessen the evil are arrived at by the author, among which may be mentioned that more attention should be given to prevention by reducing the risks of fire. The existing legislation is inadequate and lacking in uniformity, and efforts should be made to co-ordinate and strengthen such laws as are in force. There are numerous statistical tables.]

Stevenson (*Lieut. A. F.*). Income Tax for Service Men, their Wives and Next-of-Kin. A Handbook for Officers and Men of the Navy, Army, Air Force, Mercantile Marine, and Red Cross. 115 pp., 8vo. London: P. S. King and Son, 1918. Price 2*s.* 6*d.* net.

[A useful guide to Service men who are income tax payers. It explains also the concessions granted to officers in the Army and Navy and latterly to the Mercantile Marine, as regards income tax, whereby they are only taxed at the rate in force prior to the war.]

Stiles (*C. R.*). The Alphabet of Investment. With an Introductory Note by Ellis T. Powell. viii + 54 pp., 8vo. London: *Financial Review of Reviews*, 1918. Price 3*s.* net.

[A short description of methods of investment for the general public, which, in view of the largely increased numbers of small capitalists, should be of much value to those interested.]

Weyforth (*William O.*). The Organizability of Labour. (Johns Hopkins University Studies. Series xxxv. No. 2.) 277 pp., 8vo. Baltimore, 1917. Price $1 50 cents.

[This study is based on an investigation made by the author while at Johns Hopkins University. The principal sources of information have been the Trades Union publications in the University library, Government reports, and earlier studies on trades union activities by former members of the University. The author has also had numerous

Weyforth (*William O.*). The Organizability of Labour—*Contd.*

interviews with trades union officials. The percentage of those employed in industry who are members of trades unions is comparatively small, and the purpose of the study has been to analyse the problems which arise in the attempt to organize those workers who might be definitely included in the programme of trades unionism.]

Woodson (*Carter G.*). A Century of Negro Migration. vii + 221 pp., 8vo. Washington D.C.: Association for the study of negro life and history. 1918.

[This book deals with the exodus of negroes from the Southern to the Western and Northern States of the United States and the causes of this migration, which are numerous and complex. The author considers that the exodus has but begun, and his object is to direct attention to this new phase of negro American life, the economic and social effects of which cannot as yet be fully realized. The book is divided into nine chapters, and there is a bibliography and index and several maps and diagrams.]

Equal Pay and the Family. A proposal for the national endowment of motherhood. 71 pp., 8vo. London: Headley Brothers, 1918. Price 1*s.* net.

[A small committee was formed in October, 1917, at the suggestion of Miss E. F. Rathbone, to consider a national scheme of family endowment on the lines of the war separation allowances, and their conclusions are embodied in the above book, the contents of which are as follows:—Introduction. Report of the Family Endowment Committee. The treatment of the unmarried mother and her children. Endowment and the family income: a flat rate of endowment or a scale graded in accordance with income.]

Le Libre Échange International par MM. Yves Guyot, Germain Paturel, G. Schelle, J. Piebson, Fr. Mathews. iv + 228 pp., sm. 8vo. Paris: Librairie Félix Alcan, 1918. Price 2 francs.

[A reprint of six lectures given in Paris during 1918 under the auspices of the French Free Trade League. The subjects dealt with were International Free Exchange; Customs Tariffs and Industrial Prosperity; the Influence of Protection on Prices; Free Exchange in the Smaller Countries; Frederic II. and Protection; and the Economic Conditions of Peace.]

Selected Papers on Social and Economic Questions. By Sir Benjamin C. Browne . . . edited by his daughters E. M. B. and H. M. B. xvii + 287 pp., 8vo. Cambridge: University Press, 1918. Price 7*s.* 6*d.* net.

[A selection of thirty-two papers by the late Sir Benjamin Browne, several of which have already been published. They deal with economic, industrial, and social subjects, and being arranged in chronological order, show, it is claimed, the consistent evolution of his opinions. They cover a period of thirty years, and attention is drawn to the fact that some of the statistics quoted, though accurate at the time, may have since altered. The papers are well indexed.]

Argentine Republic. Intercambio economico de la Republica, 1910–17. Alejandro E. Bunge (Director-General de Estadistica de la Nacion). viii + 342 pp., 8vo. Buenos Aires, 1918.

[Chapters: 1, El comercio especial exterior, 1910-17. 2, Comercio exterior por naciones, segun los valores reales en 1910-17. 3, Navegacion exterior en 1910-17. 4, Balance economico del año 1917. 5, Movimiento demografico. 6, Importacion. 7, Exportacion. 8, La exportacion de carnes, 1910-17. 9, Precios. Segunda parte: Métodos.]

Canada. The Province of New Brunswick, its natural resources, developed and undeveloped. 27 pp., 8vo. Ottawa, 1918.

[Gives a brief account, with maps, of the geographical situation of the Province and its climate. Agricultural conditions, forestry, minerals, fisheries, water-power, and fur-bearing animals are also described.]

United States. Children's Bureau. Juvenile Delinquency in Rural New York. By Kate H. Claghorn. 197 pp., 8vo. Washington, 1918.

[A report on the causes of juvenile crime in certain country districts and the form which it takes. It was found that the subject did not lend itself to statistical treatment, so the report and its recommendations are based on a number of studies of typical village communities. As regards juvenile delinquency in town and country, the difficulties of comparison are explained, but the report states that there is a problem of juvenile crime in rural districts, and that it is a serious one.]

—— Irving National Bank, New York. Pamphlets. Vol. ii. No. 9. Trade and the War. By G. A. O'Reilly. 8vo. 1918. Vol. iii. No. 1. Broadening the Vision of the American Business Man. By L. E. Pierson. 8vo. 1918. Vol. iii. No. 2. The Trade Acceptance in Conserving the Nation's Resources. By L. E. Pierson. 8vo. 1918. Vol. iii. No. 4. Foreign Trade Thought of 1918. 8vo. 1918.

[These pamphlets are issued by the Bank as contributions to American public opinion on questions relating to their national prosperity.]

CURRENT NOTES.

The completed accounts of the foreign trade of the United Kingdom during 1918, summarised in the table below, show a value of imports for the year greater by 550,000,000*l.* than in 1913, while exports were less by 105,000,000*l.* than in 1913. Of the latter decrease, but little over a quarter results from movements in exports of British and Irish produce, the remainder being due to the great falling off in re-export trade which has been one of the features of the Accounts for more than two years. The excess of imports over exports is shown as 790,000,000*l.* or nearly six times as great as in 1913, and more than five times the average excess in the ten years before the war.

The figures showing the comparison of the principal classes of imports and exports in 1918 and 1917 are as follow. Fuller particulars will be found on pp. 136–7 :—

000's omitted.

	Twelve months ended Dec. 31, 1917.	Twelve months ended Dec. 31, 1918.	Increase (+) or decrease (–).
Imports, value c.i.f.—	£'000.	£'000.	£'000.
I. Food, drink and tobacco	454,711,	572,660,	+ 117,949,
II. Raw materials and articles mainly unmanufactured	384,799,	458,859,	+ 74,060,
III. Articles wholly or mainly manufactured............................	218,565,	280,164,	+ 61,599,
IV. Miscellaneous and unclassified (including parcel post)....	6,090,	7,656,	+ 1,566,
Total merchandise....................	1,064,165,	1,319,339,	+ 255,174,
Exports of produce and manufactures of the United Kingdom, value f.o.b.—			
I. Food, drink and tobacco	16,332,	12,067.	– 4,265.
II. Raw materials and articles mainly unmanufactured	67.162,	60,838,	– 6,324.
III. Articles wholly or mainly manufactured	423,614,	403,721.	– 19,893.
IV. Miscellaneous and unclassified (including parcel post)	19,972,	21,847,	+ 1,875,

000's omitted.

	Twelve months ended Dec. 31, 1917.	Twelve months ended Dec. 31, 1918.	Increase (+) or Decrease (−)
Exports of foreign and colonial merchandise, value f.o.b.—	£000.	£000.	£000.
I. Food, drink and tobacco	7,439,	4,030,	− 3,409.
II. Raw materials and articles mainly unmanufactured	43,374,	14,325,	− 29.049,
III. Articles wholly or mainly manufactured..........	18,794,	12,585,	− 6,209,
IV. Miscellaneous and unclassified	70,	16,	− 54,
Total, British, foreign and colonial	596,757,	529,429,	− 67,328,
Shipping—			
Entered with cargoes—	Tons.	Tons.	Tons.
British	18,795,	19,791,	+ 996.
Foreign	4,434,	3,416,	− 1,018,
Total	23.229,	23,207,	− 22,
Cleared with cargoes—			
British	16.927,	14.953,	− 1,974,
Foreign	9,149,	7,770,	− 1,379,
Total	26,076,	22,723,	− 3,353,

The continued rise in the prices of many commodities during 1918 has contributed to the expansion of values shown by the figures cited, but it must be remembered that, in the first half of 1917, the Accounts did not include certain goods imported or exported as Government property, an omission which affected, it would appear, the import side of the account. The values included in 1918 exceeded those included in 1917 (July to December) by about 143,000,000*l.*, so that a comparison of the two years on the same basis of inclusion or exclusion would, it may be supposed, reduce the growth in imports for the year by one-half or thereabouts.

The movements of the figures during the coming year will be watched with unusual interest, and it may be hoped that the export and re-export trade will show some expansion, while imports may possibly decline in value if not in volume with the reduced need for fighting material and a lower level of freights.

The restoration to the published Monthly Accounts of the figures of shipping movements in the foreign trade enables us to see that the tonnage entered with cargoes was practically the same as in 1917, but was less than half that of 1913, while for clearances the figures of 1918 were substantially less than those of 1917 and only little more than a third of those recorded for 1913. The reduction of foreign shipping taking cargoes to and from our ports during 1917 and 1918 has been a very striking phenomenon.

The following are the percentages of unemployed shown by the Trade Union Returns and the returns under the National Insurance Acts, continued from the table on page 667 of the July JOURNAL.

Percentage at end of	Trade Union returns.	National Insurance Acts.	
		1911.	1916.
July	0·6	0·57	0·85
August	0·5	0·57	0·83
September	0·5	0·57	0·83
October	0·4	0·56	0·87
November	0·5	0·70	1·33

The steady fall of unemployment recorded since March continued to the end of October. At the end of July Trade Unions making returns showed 0·6 per cent. of their numbers unemployed, as compared with 0·4 per cent. at the end of July, 1917. This unfavourable comparison was entirely due to the position in the cotton industry, and with the relaxation by the Control Board of their restrictions on the use of machinery (August 5) this position was considerably improved, so that for all the Unions making returns the percentage of unemployed at the end of August was no greater than, and at the end of subsequent months was considerably less than, a year before, the figures for the end of November being 1·1 per cent. in 1917 and 0·5 per cent. in 1918. All the indices point to a rise in unemployment following upon the signing of the Armistice, this being most marked, as was to be anticipated, in the munition trades. The employers returns for the textile trades and other industries continue to show a contraction of 5 per cent. to 7 per cent. in the numbers employed as compared with a year before, while the increase of wages paid actually rose from 10·0 per cent. on July 27 to 18·8 per cent. on September 21. The increase was most striking in the case of wages earned by textile workers, just as the actual contraction of 1·5 per cent. in wages paid between October 26 and November 23 was mainly due to the strike in the cotton industry involving about 100,000 spinners and cardroom workers.

Week ending	Textile trades. Percentage change on a year ago.		All trades covered by the returns. Percentage change on a year ago.	
	Numbers employed.	Wages paid.	Numbers employed.	Wages paid.
July 27	−9·3	+ 7·2	−7·2	+10·6
August 24	−7·7	+14·6	−5·6	+16·0
September 21	−6·1	+16·9	−4·5	+18·8
October 26	−6·1	+17·3	−5·2	+18·5
November 23	−7·6	+12·7	−6·2	+13 7

In Germany the percentage of unemployed as shown by Trade Union returns quoted by the *Labour Gazette* from the *Reichsanzeiger* was 0·8 per cent. at the end of June, falling to 0·7 per cent. at the end of July, at which it remained till the end of October except for a rise to 8 per cent. again at the end of September. In 1917 the percentage at the end of June was 0·9, which fell by the end of October to 0·7.

In Holland the percentage of unemployment in all the Unions making returns fell from 9·9 at the end of April to 9·1 in May and 8·7 in June, rising in July again to 9·2 as compared with a steady fall from 11·5 to 8·8 in the corresponding months of 1917. If the diamond industry be omitted, the figures remain high, ranging from 8·0 per cent. to 8·9 per cent., as compared with a range of 6 per cent. to 7·8 per cent. in the corresponding months of 1917. The rates of unemployment in Norway are comparatively low, though they show a uniform increase over a year before, particularly among metal workers, the largest class represented in the returns. Starting in May at 1·4 per cent., the total rate fell sharply to 0·9 per cent. in June, and rose again by the end of September to 1·1 per cent.; in 1917 the rate fluctuated between 0·8 and 0·9 per cent. In Sweden up to April 1 the rates of unemployment compared not unfavourably with those of 1917, the rate on the date mentioned being 4·9 per cent., as against 6·1 per cent. a year before. But after that date owing to the failure of the building trades to show their full seasonal recovery, combined with an aggravation of a situation already sufficiently bad in the textile industry, and a sudden increase of unemployment among the tinplate workers, the total rate rose to 5·0 per cent. on May 1 and fell on June 1 only to 4 per cent., whereas a year before the rate fell on these two dates to 4·4 per cent. and 2·8 per cent. respectively.

The average rise of retail food prices in the United Kingdom since July, 1914, which was placed at 110 per cent. on July 1, was estimated by the Ministry of Labour at 118 per cent. on August 1, 116 on September 2, 129 on October 1, 133 on November 1, and 129 on December 2. Apart from seasonal movements in the price of potatoes and eggs till the latter were brought under control, the chief changes were determined by Government action; in July the price of margarine was raised from 1*s.* to 1*s.* 2*d.* per lb. and subsequently restored to the former price in November; the scheduled prices of beef and mutton were raised by 2*d.* per lb. in September: the control of fresh eggs in October effected a reduction of 20 per cent. in their price in that month and a further fall of 12 per cent. in November, and in the former month the issue of revised prices for fish resulted in a reduction of 8 per cent.

After allowance for changes in consumption, the estimated increase in *expenditure* upon food, which was put at 67 per cent. on July 1, rose to 81 per cent. on August 1, and thereafter by smaller amounts to November 1, being 84 on September 2, 89 on October 1, and 97 on November 1, after which there was a decline to 90 per cent. on December 2, the excess over the decrease in retail prices on the last date being mainly due to a fall in the consumption of the expensive American bacon, and a further substitution of margarine for butter in the ration. A combination of the average increase in expenditure upon food since July, 1914, with the average increase in retail prices of other items (including rents) yields a resultant increase of between 85 and 90 per cent. on August 1. The increase remained at 90 per cent. on September 2, and thereafter rose to 95 per cent. on October 1, and 100 per cent. on November 1, falling to 95 per cent. on December 2 in sympathy with the other indices quoted above.

In the interval since the last number of the JOURNAL there has been issued a valuable and interesting report by the Committee appointed by the Chancellor of the Exchequer to inquire into the increase in the cost of living of the working classes during the war (Cd. 8980). The Committee estimate that the increase in the expenditure upon food by an average working-class family between July, 1914, and July, 1918, was 90 per cent. as a maximum, and that the average rise in the cost of living was 74 per cent., which by September had risen to nearly 80 per cent. It will be observed that the latter estimates are less than those quoted above as put forward by the Ministry of Labour, but this Department has always pointed out with reference to its monthly estimates that since no attempt was made in these to modify the weights attached to expenditure upon articles other than food, though it was known expenditure on such items had decreased, the resulting estimate was probably in excess of the average increase in family expenditure.

An article in the *Labour Gazette* for November summarizes the statistical work done in various countries in estimating the increase of retail prices throughout the war, and this is supplemented in other numbers by more detailed notices on individual countries. In Canada in September, 1918, the increase in expenditure upon food since July, 1914, was 79 per cent., assuming the family dietary to have remained the same throughout, while the estimated increase in total expenditure upon food, fuel, lighting, rent, &c., was 49 per cent. The increase of food prices over July, 1914, was estimated to be 32·4 per cent. in Australia for June, 40·7 per cent. in New Zealand for August, and 32 per cent. in South Africa for June, 1918.

In the United States retail food prices showed no change between the middle of March and the middle of April, but rose 3 per cent. and 2 per cent. respectively in the next two months, bringing the total increase over July, 1914, prices at the middle of June to 59 per cent. The general level of retail prices in French towns with over 10,000 inhabitants (excluding Paris) during the second quarter of 1918 was 132 per cent. above that of the fourth quarter of 1914, while in Paris in April, to which the latest data refer, the level of retail food prices was 118 per cent. above that of July, 1914. In Lisbon the retail prices of food, light, fuel and washing materials had risen by 133 per cent. in February in comparison with 1913 prices.

In Norway the increase of retail food prices between July, 1914, and August, 1918, was 184 per cent.; the increase in general household expenditure was 162 per cent., the corresponding increase in Sweden for the same period being 184 per cent. In both cases, it would appear, no allowance is made for changes in dietary or habits. On the same assumption the increases in the remaining Scandinavian country, Denmark, up to July, were 87·1 per cent. on food prices and 81·8 per cent. on general expenditure. In Amsterdam retail prices of food in June, 1918, were 86·8 per cent. above those of 1913, and in Switzerland the increase in the cost of food and other household necessities between June 1, 1914, and September 1, 1918, was 151 per cent.

As regards wholesale prices, the *Statist* and *Economist* index numbers are as follows :—

End of	*Statist* index number.	*Economist* index number.
July, 1914	82·4	116·6
July, 1918	192·9	278·5
August, 1918	195·9	284·5
September, 1918	197·1	283·5
October, 1918	197·8	282·6
November, 1918	195·3	282·6
December, 1918	196·0	277·0

Whereas in the first seven months of 1918 the *Economist* index number advanced somewhat more rapidly than the *Statist* index, during the last five months the former showed a slight decrease of 0·5 per cent. as against a further increase of 1·6 per cent. given by the latter. The chief discrepancies occur in the case of cereals and meat for the months of September and October during which the *Economist* reports an increase of 1 per cent. for the combined group whereas the *Statist* gives an increase of 14·5 per cent. for meat products against which there is to be set off a decrease of only 1 per cent. in cereals; and further in the miscellaneous group for December, where the *Economist* gives a decrease of 3·8 per cent. as against an increase of 2·9 per cent. in the index number of the *Statist*. The increase of wholesale prices since the opening of the war has been according to the *Economist* 134 per cent., and according to the *Statist* 138 per cent. The *Economist* number gives 5·2 per cent. as the total increase during 1918, as compared with 19·1 per cent. in 1917, 35 per cent. in 1916, and 29·8 per cent. in 1915.

A recent report on the adequacy of hospital accommodation in London for infants and young children by the Mansion House Council on Health and Housing gives statistics of the number of cots provided for these patients and the numbers under two years of age admitted annually. Although complete figures are not available, it appears that the number treated in poor law institutions very greatly exceeds that in the pospitals. In both cases, however, the accommodation has been considerably reduced during the war, and the general conclusion is arrived at that there is an insufficiency in most districts for the institutional treatment of infants and young children. Reports received from infant welfare centres as to the treatment and nursing in the local Poor Law infirmaries are generally unfavourable, there being but one nurse to 8 or 10 cots, as against 1 to 2½–4 in the case of the hospitals. It is stated that the results obtained in the infirmaries are inferior, and that these institutions are unpopular with parents, who are therefore reluctant to consent to institutional treatment at the stage when it could do most good. On January 1, 1914, there were 2,380 children in separate infirmaries in London and 3,043 in institutions belonging to the M.A.B. other than fever and small-pox hospitals. Of these about one-third would be infants under one year, the same proportion as in the hospitals. There are about 900 beds in children's hospitals, and 165 in the eight large general hospitals without medical schools attached. The number in the 12 large hospitals with medical schools, and in the smaller general hospitals, could not be ascertained.

The New Zealand Official Year-Book for 1917 contains an excellent section on cancer mortality during recent years, which forms the first elaborate analysis of these statistics attempted in that country. The returns for forty-five years, on which it is based, refer exclusively to the white population; but records of Maori deaths during 1915 and 1916 make it appear that the disease is very much rarer with them than with the whites. It remains to be seen whether further experience, as medical attendance and registration improve amongst the Maoris, will confirm this view.

In nearly all the aspects dealt with by the report it discloses a striking parallelism between the experiences of New Zealand and of England and Wales. In both countries there has been an enormous increase in the recorded mortality during the past 40 years. When allowance is made, by standardization, for the increased proportion of elderly persons in the population—a procedure even more necessary in New Zealand than here—the English increase is rather greater than that in New Zealand, and the level now attained there is only about four-fifths of our own. In both countries the increase has been chiefly in the male sex and at the higher ages, so that the average age at death has greatly increased. In New Zealand this average age has risen from 52 for males and 53 for females in 1872-86 to 63 for males and 59 for females in 1902–16. The death-rates for females up to 55 years of age have now ceased to rise in both countries. New Zealand mortality is now higher for males than females, taking all ages into account. This is not yet the case here, but we are moving in the same direction, as of late years the London standardized rate has been higher for males and that of the county boroughs almost as high. The author of the paper attributes this change in sex incidence to the fall in the birth-rate, which is probably an important factor also in this country. The New Zealand records confirm the observation published in the English Registrar-General's report for 1913 that cancer of the uterus is commoner, and cancer of the breast less common, in married than in single women. The author points out that from 1877 to 1899 the birth-rate was falling rapidly, but that since then the fall has been replaced by a very slight rise. He finds that the fall in the female excess of cancer mortality follows naturally, and at a reasonable distance, the steady and rapid fall in the birth-rate; that it was replaced by male excess when the birth-rate had attained its new level; and that this male excess has decreased somewhat concurrently with a slight increase of the birth-rate since 1899. This has resulted, in his opinion, from decrease of uterine cancer, as a consequence of the decrease in fertility, and he finds that the proportion of uterine to total female cancer mortality was considerably higher forty years ago than now. These observations are all in accord with English experience, allowing for the fact that the birth-rate here has not ceased to fall, but it might be dangerous in this country to push the conclusions quite so far as is done for New Zealand. Yet another point in which antipodean experience repeats our own is in regard to the ratio of male to female mortality at different ages. In both countries females suffer the higher mortality up to about 60, and males at higher ages. Here, however, the position is again reversed in extreme old age, 80 or 85 and upwards, which is not the case in New Zealand. It may be hoped that the publication of analyses of their returns on similar lines by other countries will facilitate the differentiation of those features of cancer mortality which are proper to the disease itself, at least as affecting our own race, from the accidental consequences of varying environment. The significance of the changes occurring here must be held to be greatly enhanced when we find them repeated so precisely on the opposite side of the world.

In one respect the New Zealand records have a great advantage over our own. They include returns of the results of hospital treatment classified as recovered, relieved, unrelieved or dead. The interval before report is evidently too short to guarantee permanence of recovery, but it is stated that there is good reason to believe that recovery is really permanent in a high proportion of the cases so reported. Tables are given distinguishing the different sites of cancer, from which it appears that of the cases treated during 1914-16 disease of the female breast furnished no less than 52·7 per cent. of "recoveries," whereas for the stomach and liver the proportion was only 4 per cent. Presumably the improved results now obtained from extirpation of breast cancer help to explain why, in their joint effect upon the sex rates of mortality, increase of this form of disease resulting from the falling birth-rate does not compensate for the decrease in uterine cancer similarly caused.

A little book, entitled "The Girl in Industry," by Miss D. J. Collier (G. Bell and Sons, Ltd., 1918), is of great interest, not so much for the information it contains, as for the suggestions and recommendations which the author makes.

Miss Collier has visited many of the large industrial centres, and has enquired as to the effect of employment upon industrial girls. She has seen processes and occupations as diverse as the textile mills of Lancashire and Yorkshire and the engineering factories of Coventry and Birmingham. Wherever she has gone she has asked for exact information and been unable to obtain it. No one could inform her as to the effect upon the physique or health of the girls of the work carried on. She found medical supervision lacking; any study of working hours unmade; investigation of sickness and lost time records neglected; and the need for rest periods unrecognised. She sought for the bread of knowledge and found only the stone of ignorance and indifference; yet she was enquiring concerning the future mothers of our great nation. Little wonder then that she points out that information is needed, and that information "can only be obtained by detailed and anthropometric "and medical examination carried out on a large scale," in which "the exact conditions of work, the number of hours worked, &c., "would have to be observed and a record made of the history "as well as the present physical condition of each girl examined." And we are bound to agree with her conclusion that "what is needed "is exact scientific information available for the guidance of those "responsible for the organisation of adolescent labour, and more "important still as a basis for new regulations controlling the extent "and conditions of this labour."

Of recent years a good deal of mathematical work has been done on the theory of epidemics, but it has been scattered through several journals and different writers have adopted different notations. In a paper entitled "Certain Aspects of the Theory of Epidemiology "in Special Relation to Plague," published in the 11th volume of the *Proceedings of the Royal Society of Medicine* (1918), Dr. Brownlee contributes not only a useful summary of the statistical work, particularly that of Capt. Greenwood and himself, done on plague, but also, in the form of a mathematical appendix, a complete *résumé* of the mathematical interpretations of different epidemiological theories which he and Sir Ronald Ross have formulated. A uniform notation has been introduced and the student can see at a glance the relations of the different formulæ, while one or two arithmetical illustrations are provided. Many statisticians will be grateful to Dr. Brownlee for performing this useful and laborious task.

The following analysis of books published during 1918 is reprinted from the *Publishers' Circular* of January 4, 1919 :—

Classified analysis of books published during the year 1918.

Classes of Literature.	New books.			New editions.	Totals for 1918.	Totals for 1917.
	New books.	Translations.	Pamphlets.			
Philosophy	167	3	10	26	206	201
Religion	607	8	114	54	783	759
Sociology	447	3	183	29	662	550
Law	110	—	2	18	130	146
Education	148	1	30	8	187	211
Philology	122	—	4	16	142	151
Science	232	5	28	64	329	346
Technology	279	3	9	87	378	268
Medicine, Public Health, &c.	263	11	21	85	380	300
Agriculture, Gardening	153	2	6	21	182	213
Domestic Arts	44	—	—	13	57	93
Business	152	—	5	22	179	217
Fine Arts	122	1	3	12	138	125
Music (Works about)	24	—	2	1	27	46
Games, Sports, &c.	27	—	2	12	41	47
Literature	212	1	4	33	250	216
Poetry and Drama	564	13	15	50	642	544
Fiction	755	22	--	237	1,014	1,537
Juvenile	328	2	4	50	384	539
History	516	11	64	38	629	686
Description and Travel....	159	1	6	14	180	167
Geography	47	--	—	21	68	92
Biography	185	3	11	22	221	230
General works	164	—	—	2	166	134
Military and Naval	261	4	45	31	341	313
Totals	6,088	94	568			
		6,750		966	7,716	8,131
Totals for 1917		6,606		1,525	8,131	

Analytical table showing books published each month during 1918.

	Jan.	Feb.	March.	April.	May.	June.	July.
New	637	391	463	452	478	439	520
Translations .	16	11	10	12	9	6	3
Pamphlets	57	44	43	56	50	60	54
Total new books ...	710	446	516	520	537	505	577
New editions	65	62	102	83	77	69	78
Totals	775	508	618	603	614	574	655
Total for 1917 ..	606	806	667	591	706	615	667

	August.	Sept.	Oct.	Nov.	Dec.	Totals 1918.	Totals 1917.
New	421	438	721	630	498	6,088	5,716
Translations	5	3	5	10	4	94	108
Pamphlets	36	27	63	45	33	568	782
Total new books	462	468	789	685	535	6,750	6,606
New editions	71	93	104	81	81	966	1,525
Totals	533	561	893	766	616	7,716	8,131
Total for 1917	657	607	705	800	704	8,131	—

The *Publishers' Circular and Booksellers' Record* records a total of 7,716 books as having been published during the year 1918. This is a decrease of 415 compared with the previous year; but when it is remembered that the period has been one of the utmost difficulty owing to the exhaustion of labour and materials and the enormously increased cost of production in the fourth and fifth years of the War, the total is one which gives striking proof of the vitality and enterprise of British publishing. The decrease is accounted for chiefly by a falling off in the number of works of Fiction (–523) and Juvenile Literature (–155); other classes that have also decreased slightly are Education, Agriculture, Domestic, Business, History and Geography. On the other hand, Sociology has increased by 112, Technology by 110, Medicine by 80, and Poetry by 98; and there are smaller increases in Religion, Fine Arts, Literature, Military and Naval, and Description.

Viewing the general totals, it will be noted that new publications have increased by 144, while the number of new editions has dropped by 559. An extraordinary proportion of outstanding works have appeared during the year, and the automatic curtailment of production of minor books owing to the scarcity and cost of materials may not have been an unmixed evil from the literary point of view.

The total number of books published in the various classes of literature is a rough indication of the attention bestowed by the public upon them, and it is interesting to compare the order in which the principal classes appear this year and in 1914 :—

1914.	1918.
1. Fiction.	1. Fiction.
2. Religion.	2. Religion.
3. Science.	3. Sociology.
4. Sociology.	4. Poetry.
5. Technology.	5. History.
6. Poetry.	6. Juvenile.
7. Juvenile.	7. Medicine.
8. Description.	8. Technology.
9. Literature.	9. Military and Naval.
10. { History. Medicine.	10. Science.
11. Biography.	11. Literature.
12. Military and Naval.	12. Biography.

The following totals for the last ten years are also of considerable interest :—

Year.	New books.	New editions.	Total.
1909	8,446	2,279	10,725
’10	8,468	2,336	10,804
’11	8,530	2,384	10,914
’12	9,197	2,870	12,067
’13	9,541	2,838	12,379
’14	8,863	2,674	11,537
’15	8,499	2,166	10,665
’16	7,537	1,612	9,149
’17	6,606	1,525	8,131
’18	6,750	966	7,716

It should be noted that in the following table "Education" includes only books about educational theory and practice, and not text books on special subjects, which are classed elsewhere; that under "Music" only works about music are recorded; and that books dealing generally with the European War are classed under "History," while those of a technical nature are placed under the heading "Military and Naval." It would be possible to swell the total to a much greater figure by counting numerous leaflets (Government and other), ephemeral pamphlets, the publications of borough councils and other local government bodies, and musical texts. While it is obvious that our total could be increased greatly by the inclusion of all these literary protozoa, the figures would not represent so accurately the book publishing activity of the United Kingdom.

In these tables each publication is counted as one, whether it is in one or more volumes. Serials that appear later as a collected volume are counted as an ordinary book on the appearance of that volume; so that, for example, the series of "Statutory Rules and Orders" issued by the Government, and amounting to several hundred in the year, are counted as one item on the appearance of the annual collected volume. The same rule applies to volumes of magazines, &c. Further detailed information regarding the year's publishing is supplied by the appended analytical tables.

The New Year's Honours List, 1919, included the names of the following Fellows of the Society:—

Mr. Alfred W. Soward, C.B. (a Knighthood); Mr. Percy Ashley, M.A. (C.B.); Mr. C. F. Adair Hare (C.B.); Mr. William H. Beveridge, C.B. (K.C.B.); Mr. Henry F. Howard, C.I.E. (C.S.I.); Mr. LL. S. O'Malley (C.I.E.).

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Accountants' Magazine. *November*, 1918—Some notes on the Decimal and Duodecimal Systems: *Mackay* (*William*).

Bankers' Magazine—

August, 1918—Banking Amalgamations. The Banking half-year. The repayment of the Public Debt: *Palgrave* (*Sir R. H. Inglis*). The Great Crisis: XLIX. Anglo-Argentine Banking: its present position in relation to Anglo-Argentine Trade. Comparative studies of Bank Reports.

September, 1918—The Great Crisis: L. Some new points in Banking: *Palgrave* (*Sir R. H. Inglis*). Some reflections on the Indian Gold Problem: *Burrell* (*Hubert V.*). The World's Gold Production: *Mordaunt* (*R.*). The Imperial Bank of Germany for 1917.

October, 1918—The Great Crisis: LI. The raising of fresh banking capital: *Benham* (*R.*). The Banking half-year in Canada: *Eckardt* (*H. M. P.*). Imperial Bank of Germany, Report for the year 1917. Bank of the Netherlands, 1917-18.

November, 1918—The Great Crisis: LII. The Bank Notes circulating in the United Kingdom: *Palgrave* (*Sir R. H. Inglis*).

December, 1918—The Great Crisis: LIII. The Decimal System of Coinage, Weights and Measures: *Palgrave* (*Sir R. H. Inglis*). Currency after the War: Report of the Cunliffe Committee.

January, 1919—The Progress of Banking in Great Britain and Ireland during 1918. The Reconstruction Period: I. The Banking Half-year. The Scope of a Credit Bank: *Barnfather* (*T. Gibson*).

Board of Agriculture, Journal—

July, 1918—British Agriculture as a business proposition: *Guy* (*J. H*). Ireland as a food supplier of Great Britain.

September, 1918—Beef production: *Mackenzie* (*K. J. J.*) and *Marshall* (*F. H. A.*).

August, 1918—An experiment in war time beef production: *Wood* (*T. B.*).

October, 1918—The Position of Women in Agriculture: *Hall* (*Sir A D.*). The Women's Land Army: *Lyttelton* (*Hon. Mrs. A.*). Women in Agriculture during War-Time: *Talbot* (*Meriel M.*). The Training of Women on the Land: *Macqueen* (*M. M.*). The Women of Wales and Agriculture: *Roberts* (*M. Silyn*). Women's Institutes: *Hadow* (*Grace*). The Price of Beef during the War in other countries and the United Kingdom.

UNITED KINGDOM—*Contd.*

Board of Agriculture, Journal—Contd.

December, 1918—Development of Agricultural Organisation: *Rew (Sir R. Henry)*, K.C.B. Agricultural Organisation, with particular reference to Guaranteed Minimum Prices: *Acland (Right Hon. F. D.)*, M.P. Agricultural Organisation: *Scott (Leslie)*, K.C., M.P. Co-operation and the organisation of the Dairy Industry. Report on the working of a Co-operative Cheese School. Co-operative Farmers: Some prosperous Societies.

East India Association, Journal. July, 1918—The Problem of National Education: *Panikkar (K. M.).*

Economic Journal—

September, 1918—Some Aspects of the proposed capital levy: *Scott (Prof. W. R.).* A Levy on Capital: *Mitchell (A. A.).* An estimate of the capital wealth of the United Kingdom in private hands: *Stamp (J. C.).* The Taxation of Luxury: *Lennard (R.).* The Collapse of the French Assignats: *Hawtrey (R. G.).*

December, 1918—Government Control in War and Peace: *Pigou (Prof. A. C.).* Public Control of the Location of Towns: *Ormiston (E.).* The future of London as the World's Money Market: *Wyse (R. C.).* Deflation and Prices after the War: *Lawrence (F. W. Pethick).* Gold after the War in relation to Inflation and the Foreign Exchanges: *Wicksell (Prof. K.).* Abnormal deviations in International Exchanges: *Cassel (Prof. G.).*

Eugenics Review—

October, 1918—The eugenic and social influence of the War: *Lindsay (Prof. J. A.).* The need for widespread eugenic reform during reconstruction: *Darwin (Major L.).* The sex ratio and emigration: *Stock (C. S.).*

January, 1919—Some attempts towards Race Hygiene in France during the War: *March (Lucien).* The Causes of Human Variability: *Fisher (R. A.).*

Financial Review of Reviews—

September, 1918—The proposed Levy on Capital: *Quail (Jesse).* "A Ministry of Industry and Commerce": *Richards (H. Grahame).*

December, 1918—British Consuls and British Trade: *Martin (Percy F.).* Alsace-Lorraine: *Hinks (Arthur R.).* The Future of International Finance: *Powell (Ellis T.).* "Amalgamations": *Richards (H. Grahame).* "Key" Industries and their "After the War" development in the United Kingdom: *Kershaw (John B. C.).*

Geographical Journal. August, 1918—Canada's Natural Resources and their State control: *Meighen (the Hon. Arthur).* The achievements of France in Morocco: *MacLeod (J. M.).*

Imperial Institute, Bulletin—

April–June, 1918—Indian Hides and Skins.

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Imperial Institute, Bulletin—Contd.

July–September, 1918—Development of the Trade of Burma: *Judge* (*A. S.*). British Guiana and the Problem of its development: *Egerton* (*Sir Walter*), K.C.M.G. The Future of the Trade in Cinchona Bark.

Institute of Actuaries, Journal. October, 1918—Newton's Interpolation Formula: *Fraser* (*Duncan C.*).

Manchester Statistical Society, Transactions. Session 1917–18—The Cotton Trade at the close of the Napoleonic War: *Daniels* (*G. W.*). Certain influences affecting the national rate of population: *Poock* (*the Very Rev. Monsignor*). Lancashire Vital Statistics as disclosed by the last Census: *Nathan* (*Eric*). Substituted Labour of Women, 1914–1917: *Robinson* (*Mrs. Annot*). British Mercantile Marine in its relation to the State: *Hill* (*Norman*). Capital: its rights and responsibilities: *Bell* (*Sir Hugh*), Bart.

Nature. January 2, 1919—International Organisation of Science. Scientific Research and Preventive Medicine.

Public Health. October, 1918—The Housing Problem: *Newsholme* (*Sir Arthur*). Milk Grading: *Priestley* (*Joseph*).

Royal Agricultural Society, Journal. Vol. 78, 1917—The new agricultural policy and the dairy-farming industry: *Mackintosh* (*James*). The wastage of milk: *Williams* (*R. Stenhouse*). Some problems of reafforestation: *Somerville* (*W.*). The Corn and Meat trades during the War: iii. The Corn-trade: (*Kains-Jackson* (*C.*). Agricultural Statistics: *Stanley* (*Russell E.*). The weather of the past agricultural year: *Brodie* (*Frederick J.*). Rainfall, temperature and bright sunshine during 1917.

Royal Asiatic Society's Journal. July and October, 1918—The Value of Money at the Court of Akbar: *Moreland* (*W. H.*).

Royal Philosophical Society of Glasgow, Proceedings. Vol. XLVIII, 1916–17—Forestry and the War: *Stirling-Maxwell* (*Sir John*), Bart. The Place of the woman worker in reconstructed industry: *Mitchell* (*Elizabeth B.*). Trade after the War: *Murray* (*James W.*).

Royal Society, Proceedings. August 1, 1918—A statistical survey of Colour Vision: *Houstoun* (*R. A.*).

Surveyors' Institution, Transactions. Vol. LI, 1918–19. *Part* II—First report of the Committee dealing with the law and practice relating to the Acquisition and Valuation of Land for Public Purposes: *Wallis* (*John D.*).

United Empire (*Royal Colonial Institute Journal*)—

August, 1918—The British West Indies: *Mason* (*Capt. G. B.*).

September, 1918—The Economics of Empire: *Lang* (*William*).

October, 1918—Canada and the West Indies: *Crowe* (*Harry J.*).

November, 1918—The Imperial Population after the War: *Sedgwick* (*T. E.*).

INDIA—

Indian Economic Society, Journal. September, 1918—Small Holdings in India and their remedies: *Ambedkar* (*Bhimrao R.*). A few observations on the economics of Education: *Kale* (*V. G.*). The Income Tax Act of 1918 and the Indian mercantile community: *Vakil* (*Maneklal H.*). Taxes *versus* loans: *Deole* (*C. S.*).

Indian Journal of Economics. July, 1918—South Indian economics: *Slater* (*Gilbert*). Size of Land Holdings in the Bombay Presidency: Appendix I. Examples of subdivision. Appendix II. Fragmentation and remedial measures taken in other countries: *Keatinge* (*G. F.*). The Art of Economic Development (*continued*). V. Principles of Finance: *Jevons* (*H. Stanley*). An Australian Irrigation Scheme: *From Official Sources.*

UNITED STATES—

American Economic Review—

September, 1918—Recent developments in the British Labor movement: *Cole* (*G. D. H.*). Private colonisation of the land: *Ely* (*Richard T.*). Historical approach to economics: *Loos* (*Isaac A.*). Substance and shadow in war finance: *Plehn* (*Carl C.*). The Market Gage Dollar: *Tinnes* (*D. J.*).

December, 1918—Dependency Index of New York City, 1914–17: *Rubinow* (*I. M.*). Diminishing Returns in Manufactures: *Mixter* (*Charles W.*). Closed Shop *versus* Open Shop: *Hoagland* (*H. E.*). Relations between Labor and Capital, and Reconstruction: *Sprague* (*O. M. W.*). The Theory of Railroad Reorganization: *Dewing* (*Arthur S.*).

American Philosophical Society, Proceedings. Vol. LVII. 1918. *No.* 5—Physiological effects of a prolonged reduction in diet on twenty-five men: *Benedict* (*F. G.*). Food Conservation from the standpoint of the Chemistry of Nutrition: *Sherman* (*H. C.*). Some economic aspects of the American Food Supply: *Smith* (*J. Russell*).

American Journal of Sociology—

July, 1918—The sociological theories of Franklin H. Giddings: *Northcott* (*Clarence H.*). Propaedeutic to modern economics: *Loos* (*Isaac*). Alcohol and crime: a study in social causation: *Howard* (*George Elliott*). The sociological aspects of our educational aims: *Smith* (*Walter Robinson*).

September, 1918—The diseases of social structures: *Ross* (*E. A.*). Propaedeutic to modern economics (*continued*): *Loos* (*Isaac*).

November, 1918—The supervision of the social order: *Kern* (*R. R.*). Sociology as Ethics: *Hayes* (*Edward Cary*). Rural Sociology: standardization of research. Co-operative plan of National Rural Research.

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June, 1918—Internal and external statistical needs of American business: *Hathaway* (*W. A.*). A phase of the external statistical needs of American business: *Clark* (*Earle*). The scope of business statistics: *Faulkner* (*Roland P.*). Infant Mortality Studies of the Children's Bureau: *Woodbury* (*R. M.*). Statistical work in the office of the Surgeon-General of the Army: *Pollock* (*Horatio M.*). Visiting Nursing and Life Insurance: *Frankel* (*L. K.*) and *Dublin* (*L. I.*).

September, 1918—The Relation between Birth-rate and Death-rate in a normal population and the rational basis for an empirical formula for the mean length of life given by William Farr: *Lotka* (*Alfred J.*). Occupational propinquity as a factor in marriage selection: *Marvin* (*Donald M.*).

Annals of the American Academy of Political and Social Science—

July, 1918—How the public should pay for the War: *Fisher* (*Irving*). Some tendencies in the Federal Reserve system: *Patterson* (*E. M.*). The fallacy of price bidding: *Patten* (*Simon N.*). International and National Food Control: *Taylor* (*Alonzo*). Essentials to a Food program for next year: *Pinchot* (*Gifford*). The supply of Wheat: *Norris* (*George W.*). The Live-stock and Meat situation: *Weld* (*L. D. H.*).

September, 1918—A series of articles on War Relief Work.

November, 1918—A series of articles on the Rehabilitation of the Wounded.

Bankers' Magazine. October, 1918—The Gold situation: *Clausen* (*John*). America the creditor nation: *Rovensky* (*J. E.*).

Journal of Political Economy—

July, 1918—The World's coal situation during the War (II): *Notz* (*William*). Commercial banking and capital formation (III): *Moulton* (*H. G.*). Our Trade Balance and our Foreign Loans: *Berglund* (*Abraham*).

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November, 1918—Commercial Banking and Capital Formation: *Moulton* (*H. G.*). Compulsory Arbitration in Great Britain during the War: *Moses* (*Milton*).

December, 1918—The problem of Demobilization. Production after the War: *Hayes* (*H. Gordon*). The Taxable Income of the United States: *Friday* (*David*).

Quarterly Journal of Economics—

August, 1918—International Tariff relations as affected by the War: *Culbertson* (*W. S.*). Sugar prices and distribution under food control: *Blakey* (*Roy G.*). Price-fixing in the iron and steel industry: *Berglund* (*Abraham*). Perishable produce under food regulation: *Gephart* (*W. F.*). The distributive relations of indirect goods: *Davenport* (*H. J.*).

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Quarterly Journal of Economics—Contd.

November, 1918—The Wheat and Flour Trade under Food Administration Control: 1917-18: *Eldred* (*Wilfred*). The Price-fixing of Copper: *Morse* (*Louis Kennedy*). An estimate of the Standard of Living in China: *Dittmer* (*C. G.*). Railway service and regulation: *Ruggles* (*C. O.*).

University of California, Chronicle. July, 1918—Some phases of Finance during the Great War: *Plehn* (*Carl C.*).

EGYPT—

L'Égypte Contemporaine—

November, 1918—Le syndicalisme, la mutualité et la co-opération dans l'organisation agricole de Belgique: *Wathelet* (*J.*).

January, 1919—L'après-guerre Européen et le mouvement du droit privé en Égypte: *Caselli* (*E. P.*). La co-opération aux Indes: *Hogg* (*E. G.*). Les Co-opératives agricoles en Roumanie: *Michel* (*B.*).

FRANCE—

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Bulletin de Statistique et de Législation Comparée—

August, 1918—Les ressources économiques et financières de la Russie, par régime et par gouvernement.

September, 1918—Quelques données statistiques sur la Pologne russe.

October, 1918—Le blé russe.

Journal des Économistes—

August, 1918—L'industrie maritime britannique: *Yves-Guyot.* Le renouvellement du privilège de la Banque de France: *Yves-Guyot.* La question monétaire en Australie: *Raffalovich* (*Arthur*). Federal Reserve gold holding (graphic table).

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LIST OF ADDITIONS TO THE LIBRARY.

Since the end of July, 1918, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

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—— No. 119. Reports and Papers on Malaria contracted in England in 1917. 85 pp., 8vo. 1918. (Local Government Board.)

Trade. Accounts relating to the Trade and Commerce of certain Foreign Countries and British Possessions (Sir Albert Stanley); including figures received up to 31st July, 1918. 55 pp. 1918. (Board of Trade.)

(b) India and Dominions.

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Prices and Wages in India. 278 pp., fol. Calcutta, 1918. (Department of Statistics.)

District Gazetteers, various, 1916–17. (India Office.)

Trade. Statistical Tables showing for each of the years 1901–02 to 1916–17 the estimated value of the Imports and Exports of India at the prices prevailing in 1899–1900 to 1901–02; with an Introductory Memorandum. 34 pp., fol. Calcutta, 1918.

Australian Commonwealth—

Vital Statistics. Labour and Industrial Branch, Report No. 8. Prices, Purchasing Power of Money, etc., 1917. 180 pp., 8vo. Melbourne, 1918. (Commonwealth Statistician.)

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Union of South Africa—

Cape Province. Ordinances, 1918. 81 pp., fol. 1918.

(c) Foreign Countries.

Argentina—

Intercambio Económico de la Republica, 1910-17. 342 pp., 8vo. Buenos Aires, 1918. (Director General de Estadistica.)

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Finland—

Social Statistics. Atlas de Statistique Sociale sur les Communes Rurales de Finlande en 1901. (With 31 pp. 8vo of explanatory letterpress.) 1 vol., fol. Helsingfors, 1908. (Bureau de Statistique de Finlande.)

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  Livre III. La Propriété des Capitaux, des Agents Naturels et des Biens Incorporels. 452 pp. 3 vols., 8vo. Paris, 1915–18. (Felix Alcan.)
  Supplément aux Livres IV, V, VI.—Statistiques de l'Année 1913 et Relevés Retrospectifs en France et à l'Étranger. (Le Commerce International et la Marine Marchande, la Dette, le Budget et les Impôts en France, les Voies de Communications et les Transports.) 48 pp., 8vo. Paris, 1918.

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Values of Imports *into the United Kingdom for the Years* 1916-17-18.*

[From the Monthly Trade Returns, December, 1918.]

	Year ended December 31, 1916.	Year ended December 31, 1917.	Year ended December 31, 1918.	Increase (+) or Decrease (–) in 1918 as Compared with 1917.	Increase (+) or Decrease (–) in 1918 as Compared with 1916.
	£	£	£	£	£
FOOD, DRINK, AND TOBACCO—					
A. Grain and flour	133,253,132	175,000,319	154,404,011	–20,596,308	+21,150,879
B. Meat including animals for food	94,050,999	102,398,081	174,088,292	+71,690,211	+80,037,293
C. Other food and drink—					
(1.) Non-dutiable	93,980,052	96,400,478	128,409,338	+32,008,860	+34,429,286
(2.) Dutiable	90,518,133	76,988,123	97,515,242	+20,527,119	+ 6,997,109
D. Tobacco	7,364,308	3,923,954	18,242,807	+14,318,853	+10,878,499
Total, Class I.	419,166,624	454,710,955	572,659,690	+117,948,735	+153,493,066
II. RAW MATERIALS AND ARTICLES MAINLY UNMANUFACTURED—					
A. Coal, coke, and manufactured fuel	7,978	6,419	430	– 5,989	– 7,548
B. Iron ore, scrap iron, and steel	12,136,066	12,138,373	13,435,171	+ 1,296,798	+ 1,299,105
C. Other metallic ores	13,679,870	15,328,513	17,656,360	+ 2,327,847	+ 3,976,490
D. Wood and timber	40,163,994	25,645,897	29,181,919	+ 3,536,022	–10,982,075
E. Cotton	84,729,677	110,590,634	150,286,308	+39,695,674	+65,556,631
F. Wool	39,730,623	51,729,188	39,659,797	–12,069,391	– 70,826
G. Other textile materials	23,840,128	28,014,754	31,369,501	+ 3,354,747	+ 7,529,373
H. Oil seeds, nuts, oils, fats, and gums	63,356,728	75,773,198	116,643,336	+40,870,138	+53,286,608
I. Hides and undressed skins	13,784,590	18,382,830	18,844,011	+ 461,181	+ 5,059,421
J. Paper-making materials	8,134,508	10,358,876	13,149,931	+ 2,791,055	+ 5,015,423
K. Miscellaneous	37,227,578	36,829,759	28,632,277	– 8,197,482	– 8,595,301
Total, Class II.	336,791,740	384,798,441	458,859,041	+74,060,600	+122,067,301
III. ARTICLES WHOLLY OR MAINLY MANUFACTURED—					
A. Iron and steel and manufactures thereof	11,214,097	10,782,609	9,709,523	– 1,073,086	– 1,504,574
B. Other metals and manufactures thereof	39,048,339	43,627,977	46,694,463	+ 3,066,486	+ 7,646,124
C. Cutlery, hardware, implements (except machine tools), and instruments	5,702,664	4,983,026	5,785,871	+ 802,845	+ 83,207
D. Electrical goods and apparatus (other than machinery and uninsulated wire)	1,652,853	1,334,719	1,048,828	– 285,891	– 604,025
E. Machinery	7,988,039	8,863,405	10,700,916	+ 1,837,511	+ 2,712,877
F. Ships (new)	14,425	125	1,226	+ 1,101	– 13,199
G. Manufactures of wood and timber (including furniture)	1,927,137	1,326,242	2,077,047	+ 750,805	+ 149,910
H. Yarns and textile fabrics—					
(1.) Cotton	8,309,363	3,862,050	4,938,279	+ 1,076,229	– 3,371,084
(2.) Wool	922,701	251,804	149,171	– 102,633	– 773,530
(3.) Silk	13,148,986	11,420,296	17,220,607	+ 5,800,311	+ 4,071,621
(4.) Other materials	11,202,998	8,130,591	6,440,849	– 1,689,742	– 4,762,149
I. Apparel	2,730,567	1,365,703	1,288,442	– 77,261	– 1,442,125
J. Chemicals, drugs, dyes, and colours	28,622,052	28,027,543	38,543,957	+10,516,414	+ 9,921,905
K. Leather and manufactures thereof (including gloves, but excluding boots and shoes)	16,188,901	11,095,586	10,337,083	– 758,503	– 5,851,818
L. Earthenware and glass	3,053,005	655,440	311,775	– 343,665	– 2,741,230
M. Paper	8,327,405	4,189,314	5,131,810	+ 942,496	– 3,195,595
N. Railway carriages and trucks (not of iron), motor cars, cycles, carts, &c.	5,993,860	7,506,114	12,309,828	+ 4,803,714	+ 6,315,968
O. Miscellaneous	23,146,956	71,142,352	107,474,122	+36,331,770	+84,327,166
Total, Class III	189,194,348	218,564,896	280,163,797	+61,598,901	+90,969,499
IV. MISCELLANEOUS AND UNCLASSIFIED (including parcel post)	3,353,780	6,090,386	7,656,063	+ 1,565,677	+ 4,302,283
Total	948,506,492	1,064,164,678	1,319,338,591	+255,173,913	+370,832,099

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* The values of the imports represent the cost, insurance, and freight; or, when goods are consigned for sale, the latest sale value of such goods.

Values of **Exports** *of British and Irish Produce and Manufactures for the Years* **1916-17-18.***

[From the Monthly Trade Returns, December, 1918.]

	Year ended December 31,			Increase (+) or Decrease (–) in 1918 as Compared with 1917.	Increase (+) or Decrease (–) in 1918 as Compared with 1916.
	1916.	1917.	1918.		
I. FOOD, DRINK, AND TOBACCO—	£	£	£	£	£
A. Grain and flour	2,774,694	861,633	449,439	– 412,194	– 2,325,255
B. Meat, including animals for food	1,241,817	268,630	120,157	– 148,473	– 1,121,660
C. Other food and drink	20,712,880	11,904,047	8,013,704	– 3,890,343	– 12,699,176
D. Tobacco	4,765,777	3,297,543	3,483,413	+ 185,870	– 1,282,364
Total, Class I.	29,495,168	16,331,853	12,066,713	– 4,265,140	– 17,428,455
II. RAW MATERIALS AND ARTICLES MAINLY UNMANUFACTURED—					
A. Coal, coke, and manufactured fuel	50,670,604	51,341,487	52,416,330	+ 1,074,843	+ 1,745,726
B. Iron ore, scrap iron, and steel	300,779	111,868	85,734	– 26,134	– 215,045
C. Other metallic ores	19,709	20,964	10,271	+ 10,693	– 9,438
D. Wood and timber	308,704	495,491	923,838	+ 428,347	+ 615,134
E. Cotton	...	...	...	...	...
F. Wool	3,682,037	3,185,522	1,706,669	– 1,478,853	– 1,975,368
G. Other textile materials	576,076	264,111	89,155	– 174,956	– 486,921
H. Oil seeds, nuts, oils, fats, and gums	4,600,110	8,032,047	2,755,975	– 5,276,072	– 1,844,135
I. Hides and undressed skins	1,528,470	1,317,375	1,201,842	– 115,533	– 326,628
J. Paper-making materials	538,928	489,656	262,881	– 226,775	– 276,047
K. Miscellaneous	2,119,681	1,903,274	1,385,531	– 517,743	– 734,150
Total, Class II.	64,345,098	67,161,795	60,838,226	– 6,323,569	– 3,506,872
III. ARTICLES WHOLLY OR MAINLY MANUFACTURED—					
A. Iron and steel and manufactures thereof	56,673,705	44,828,253	36,731,455	– 8,096,798	– 19,942,250
B. Other metals and manufactures thereof	12,720,016	10,284,611	9,009,620	– 1,274,991	– 3,710,396
C. Cutlery, hardware, implements (except machine tools), and instruments	6,446,522	4,750,777	4,388,946	– 361,831	– 2,057,576
D. Electrical goods and apparatus (other than machinery and uninsulated wire)	4,084,013	2,926,222	2,152,482	– 773,740	– 1,931,531
E. Machinery	20,217,598	19,482,924	16,062,593	– 3,420,331	– 4,155,005
F. Ships (new)	1,290,585	1,087,307	607,083	– 480,224	– 683,502
G. Manufactures of wood and timber (including furniture)	1,276,979	859,923	469,801	– 390,122	– 807,178
H. Yarns and textile fabrics—					
(1.) Cotton	118,307,992	145,924,711	180,103,022	+ 34,178,311	+ 61,795,030
(2.) Wool	46,905,649	52,847,674	49,735,844	– 3,111,830	+ 2,830,195
(3.) Silks	2,406,118	2,018,056	2,102,318	+ 84,262	– 303,800
(4.) Other materials	15,817,943	16,943,970	11,048,545	– 5,895,425	– 4,769,398
I. Apparel	16,941,093	15,762,497	11,637,387	– 4,125,110	– 5,303,706
J. Chemicals, drugs, dyes, and colours	27,565,087	23,583,139	22,740,983	– 842,156	– 4,824,104
K. Leather and manufactures thereof (including gloves, but excluding boots and shoes)	4,897,503	4,968,007	1,545,714	– 3,422,293	– 3,351,789
L. Earthenware and glass	3,917,916	3,893,117	3,968,006	+ 74,889	+ 50,060
M. Paper	5,195,187	3,194,672	3,163,995	– 30,677	– 2,031,192
N. Railway carriages and trucks (not of iron), motor cars, cycles, carts, &c.	8,033,233	6,878,309	6,504,595	– 373,714	– 1,528,638
O. Miscellaneous	40,700,582	63,380,029	41,718,531	– 21,631,498	+ 1,047,919
Total, Class III.	393,397,751	423,614,198	403,720,920	– 19,893,278	+ 10,323,169
IV. MISCELLANEOUS AND UNCLASSIFIED (including parcel post)	19,041,690	19,971,900	21,847,206	+ 1,875,306	+ 2,805,516
Total	506,279,707	527,079,746	498,473,065	– 28,606,681	– 7,806,642

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* The values of the exports represent the cost and the charges of delivering the goods on board the ship, and are known as the "free on board" values.

BANK OF ENGLAND.

Pursuant to the Act 7th and 8th Victoria, cap. 32 (1844),

[0,000's omitted.]

1	2	3	4	5	6	7
Issue Department.					Collateral Columns.	
Liabilities.		Assets.				
otes Issued.	Dates. (Wednesdays.)	Government Debt.	Other Securities.	Gold Coin and Bullion.	Notes in Hands of Public. (Col. 1 minus col. 16.)	Minimum Rates of Discount at Bank of England.
£ Mlns.	1918.	£ Mlns.	£ Mlns.	£ Mlns.	£ Mlns.	Per cent.
76,49	Jan. 2	11,01	7,43	58,04	46,59	5
76,35	,, 9	11,01	7,43	57,90	45,70	
76,07	,, 16	11,01	7,43	57,62	45,32	
76,23	,, 23	11,01	7,43	57,78	45,22	
75,93	,, 30	11,01	7,43	57,48	45,89	
75,92	Feb. 6	11,01	7,43	57.47	46,13	
76,27	,, 13	11,01	7,43	57,82	46,08	
75,88	,, 20	11,01	7,43	57.43	46,20	
76,73	,, 27	11,01	7,43	58,28	47,25	
77,52	Mar. 6	11,01	7,43	59,07	47,59	
77,58	,, 13	11,01	7,45	59.13	47,28	
78,16	,, 20	11,01	7,43	59,71	47,35	
78,14	,, 27	11,01	7,43	59,69	47,81	
79,00	April 3	11,01	7,43	60,55	47,99	
78,14	,, 10	11,01	7,43	59.69	47,88	
78,76	,, 17	11,01	7,43	60,31	47,88	
78,74	,, 24	11,01	7,43	60,29	48,40	
79,09	May 1	11,01	7,43	60,42	49,43	
79,20	,, 8	11,01	7,43	60,75	49,68	
79,57	,, 15	11,01	7,43	61,12	49,97	
80,49	,, 22	11,01	7,43	62,04	50,24	No change during year
81,32	,, 29	11,01	7,43	62,87	51,05	
81,66	June 5	11,01	7,43	63,21	51,85	
81,70	,, 12	11,01	7,43	63,25	52,02	
82,06	,, 19	11,01	7,43	63,61	52,38	
83,05	,, 26	11,01	7,43	64,60	53,67	
83,18	July 3	11,01	7,43	64,73	54,90	
83,81	,, 10	11,01	7,43	65.36	55,09	
84,29	,, 17	11,01	7,43	65,84	55,36	
84,93	,, 24	11,01	7,43	66,18	55,74	
85,01	,, 31	11,01	7,43	66,56	56,87	
85,81	Aug. 7	11,01	7,43	67,36	56,77	
86,00	,, 14	11,01	7,43	67,55	56,69	
84,46	,, 21	11,01	7,43	68,01	56,74	
87,33	,, 28	11,01	7,43	68,88	57,61	
87,70	Sept. 4	11,01	7,43	69,25	58,59	
88,49	,, 11	11,01	7,43	70,04	59,05	
88,70	,, 18	11,01	7,43	70,25	59,39	
89,22	,, 25	11,01	7,43	70,77	60,49	
89,82	Oct. 2	11,01	7,43	71,37	62,25	
90,77	,, 9	11,01	7,43	72.32	62,79	
90,88	,, 16	11,01	7,43	72,43	62,99	
91,08	,, 23	11,01	7,43	72,63	63,39	
91,56	,, 30	11,01	7,43	73,11	64,20	
91,79	Nov. 6	11,01	7,43	73,34	64,69	
92,32	,, 13	11,01	7,43	73,87	64,93	
92,94	,, 20	11,01	7,43	74,49	65,22	
93,70	,, 27	11,01	7,43	75,25	65,99	
93,87	Dec. 4	11,01	7,43	75,42	67.04	
95,60	,, 11	11,01	7,43	77,15	67,50	
96,42	,, 18	11,01	7,43	77,97	68,96	
97,00	,, 25	11,01	7,43	78,55	70,30	

–WEEKLY RETURN.

or Wednesday in each Week, during the Year **1918.**

[0,000's omitted.]

8	9	10	11	12	13	14	15	16	17	18
BANKING DEPARTMENT.										
Liabilities.					Dates. (Wednesdays.)	Assets.				Totals of Liabilities and Assets.
Capital and Rest.		Deposits.		Seven Day and other Bills.		Securities.		Reserve.		
Capital.	Rest.	Public.	Private.			Government.	Other.	Notes.	Gold and Silver Coin.	
£ Mlns.	£ Mlns.	£ Mlns.	£ Mlns.	£ Mlns.	1918.	£ Mlns.	£ Mlns.	£ Mlns.	£ Mlns.	£ Mlns.
14,55	3,32	32,07	158,41	,1	Jan. 2	70,83	106,48	29,90	1,15	208,37
14,55	3,36	37,89	123,53	,0	„ 9	56,86	90,66	30,65	1,16	179,35
14,55	3,36	41,41	121,58	,1	„ 16	56,76	92,27	30,75	1,14	180,93
14,55	3,37	41,81	124,44	,1	„ 23	56,83	95,21	31,01	1,13	184,19
14,55	3,48	38,23	122,64	,1	„ 30	55,87	91,88	30,03	1,12	178,92
14,55	3,50	41,14	125,50	,1	Feb. 6	56,88	96,89	29,79	1,13	184,71
14,55	3,50	39,01	126,26	,1	„ 13	56,34	95,66	30,21	1,11	183,34
14,55	3,50	38,56	131,87	,1	, 20	56,35	101,44	29,67	1,04	188,50
14,55	3,56	42,64	124,76	,1	„ 27	56,35	98,64	29,48	1,06	185,54
14,55	3,57	41,02	137,71	,1	Mar. 6	67,73	98,19	29,93	1,00	196,87
14,55	3,56	38,35	128,99	,1	„ 13	56,62	97,60	30,30	,94	185,47
14,55	3,59	35,37	134,38	,1	„ 20	56,98	99,22	30,80	,88	187,91
14,55	3,59	43,84	137,54	,1	„ 27	55,95	112,35	30,33	,91	199,55
14,55	3,55	36,28	150,27	,1	April 3	59,30	113,48	31,00	,87	204,67
14,55	3,10	40,07	132,19	,1	„ 10	56,86	102,06	30,26	,74	189,94
14,55	3,07	39,95	138,23	,1	„ 17	58,31	105,95	30,87	,68	195,82
14,55	3,06	34,83	140,15	,1	„ 24	56,72	104,84	30,33	,71	192,61
14,55	3,10	34,37	137,65	,1	May 1	56,45	102,86	29,65	,71	189,69
14,55	3,14	37,57	128,12	,1	„ 8	55,87	97,41	29,51	,61	183,41
14,55	3,18	41,45	133,82	,1	„ 15	57,31	105,52	29,59	,58	193,02
14,55	3,12	38,43	127,60	,0	„ 22	55,58	97,30	30,24	,59	183,72
14,55	3,18	41,05	135,26	,0	„ 29	56,73	106,48	30,27	,57	194,07
14,55	3,21	38,66	131,90	,1	June 5	56,40	101,55	29,80	,58	188,35
14,55	3,22	43,01	126,56	,1	„ 12	56,14	100,91	29,68	,62	187,37
14,55	3,20	36,12	125,18	,1	„ 19	53,74	95,05	29,68	,59	179,07
14,55	3,26	35,77	128,84	,1	„ 26	51,65	100,79	29,38	,61	182,45
14,55	3,24	38,17	152,06	,1	July 3	66,23	112,93	28,27	,60	208,05
14,55	3,29	38,34	140,41	,1	„ 10	57,37	109,92	28,72	,59	196,62
14,55	3,31	38,21	134,79	,1	„ 17	55,77	105,52	28,92	,65	190,88
14,55	3,29	34,67	136,69	,1	„ 24	56,06	103,31	29,19	,64	189,22
14,55	3,43	37,78	138,44	,1	„ 31	58,60	106,78	28,14	,69	194,22
14,55	3,46	39,87	132,76	,1	Aug. 7	57,85	103,19	29,04	,58	190,67
14,55	3,49	34,09	137,72	,1	„ 14	59,70	100,18	29,31	,67	189,88
14,55	3,48	33,69	135,99	,0	„ 21	58,42	98,95	29,71	,64	187,73
14,55	3,49	34,91	136,10	,1	„ 28	59,45	99,25	29,72	,65	189,08
14,55	3,53	37,01	131,72	,1	Sept. 4	58,16	98,88	29,11	,67	186,83
14,55	3,51	36,12	138,92	,1	„ 11	64,64	98,39	29,43	,66	193,13
14,55	3,51	38,13	129,95	,0	„ 18	56,56	99,54	29,30	,74	186,16
14,55	3,54	31,94	133,98	,0	„ 25	54,20	100,33	28,73	,76	184,03
14,55	3,53	30,52	137,12	,1	Oct. 2	57,67	99,72	27,57	,78	185,75
14,55	3,03	28,32	137,58	,1	„ 9	59,24	95,51	27,98	,78	183,51
14,55	3,04	34,25	133,66	,1	„ 16	60,26	96,61	27,88	,76	185,53
14,55	3,09	32,04	120,13	,0	„ 23	45,99	95,38	27,68	,77	169,83
14,55	3,12	29,63	133,97	,0	„ 30	57,75	95,35	27,36	,82	181,30
14,55	3,15	31,67	131,44	,0	Nov. 6	57,86	95,12	27,09	,74	180,83
14,55	3,18	30,00	138,70	,0	„ 13	58,59	99,76	37,39	,70	186,45
14,55	3,16	29,66	142,67	,0	„ 20	61,78	99,87	27,72	,67	190,06
14,55	3,18	30,42	133,97	,0	„ 27	62,62	100,99	27,71	,58	191,92
14,55	3,26	26,53	154,19	,1	Dec. 4	73,54	97,59	26,82	,58	198,55
14,55	3,27	27,41	152,99	,1	„ 11	73,68	95,90	28,09	,57	198,25
14,55	3,24	28,86	143,88	,0	„ 18	69,25	93,21	27,46	,62	190,56
14,55	3,25	23,64	149,03	,0	„ 25	71,10	92,14	26,69	,55	190,49

REVENUE OF THE UNITED KINGDOM.

Net Produce in Quarters in 1918, *and in Financial Years ended March* 31, 1917-18, 1916-17, 1915-16, 1914-15.

[000's omitted.]

QUARTERS, ended	March 31, 1918.	June 30, 1918.	September 30, 1918.	December 31, 1918.	Total for Calendar Year 1918.
	£	£	£	£	£
Customs	18,151,	22,912,	24,696,	26,036,	91,795,
Excise	10,568,	10,788,	14,485,	17,824,	53,665,
Stamps and estate duties	11,147,	5,629,	10,114,	10,585,	37,475,
Taxes (Land Tax and House Duty)	2,195,	280,	10,	60,	2,545,
Postal Service......	8,400,	4,850,	8,300,	7,050,	28,600,
Telephone Service	1,900,	1,700,	1,500,	1,650,	6,750,
Telegraph Service ...	900,	850,	900,	1,100,	3,750,
	53,261,	47,009,	60,005,	64,305,	224,580,
Property and Income Tax, including Super-tax	171,602,	27,237,	34,554,	21,594,	254,987,
	224,863,	74,246,	94,559,	85,899,	479,567,
Excess Profits Duty	71,269,	62,955,	70,723,	70,640,	275,587.
Land value duties ...	376,	171,	81,	71,	699,
Crown Lands	230,	150,	190,	260,	830,
Interest on Advances	4,337,	14,	565,	2,255,	7,171,
Miscellaneous	5,509,	14,560,	21,548,	6,619,	48,236,
Totals	306,584,	152,096,	187,666,	165,744,	812,090,

YEARS, ended March 31,	1917-18.	1916-17.	1917-18.		Corresponding Years.	
			Increase.	Decrease.	1915-16.	1914-15.
	£	£	£	£	£	£
Customs	71,261,	70,561,	700,	—	59,606,	38,662,
Excise	38,772,	56,380,	—	17,608,	61,210,	42,313,
Stamps and estate duties	39,974,	39,110,	864,	—	37,799,	35,959,
Taxes (Land Tax and House Duty)	2,625,	2,580,	45,	—	2,650,	2,560,
Postal Service	25,200,	24,350,	850,	—	24,100,	20,400,
Telephone Service	6,600,	6,400,	200,	—	6,450,	6,250,
Telegraph Service	3,500,	3,350,	150,	—	3,350,	3,000,
	187,932,	202,731,	2,809,	17,608,	195,165,	149,144,
Property and Income Tax, including Super-tax	239,509,	205,033,	34,476,	—	128,320,	69,399,
	427,441,	407,764,	37,285,	17,608,	323,485,	218,543,
Excess Profits Duty	220,214,	139,920,	80,294,	—	140,	—
Land value duties	685,	521,	164,	—	363,	412,
Crown Lands	690,	650,	40,	—	550,	545,
Interest on Advances	6,056,	8,056,	—	1,999,	2,432,	1,277,
Miscellaneous	52,148,	16,517,	35,631,	—	9,797,	5,917,
Totals	707,234,	573,428,	153,414,	19,607,	336,767,	226,694,
			NET INC. £133,806.			

FOREIGN EXCHANGES.—*Quotations as under*, LONDON *on Paris and Calcutta, and New York and Hong Kong on* LONDON, *for* **1918.**

1	2	3	4	5	6	7	8
		Calcutta.				Price per Ounce.	
DATES. (Wednesdays)	London on Paris. Cables. (Thursdays)	London on Calcutta. Demand.	India Council Bills. Minimum Price per Rupee. Immediate T.T.	New York on London. Cables.	Hong Kong on London. T.T.	Gold Bars (Fine).	Standard Silver in Bars.
1918.	f. c.	s. d.	s. d.	$ cts.	s. d.	s. d.	s. d.
Jan. 2	27·20	1 5	1 5	4·76$\frac{7}{16}$	*2 11$\frac{3}{4}$	77 9	3 7$\frac{1}{2}$
„ 16	27·07	1 5	1 5	4·76$\frac{7}{16}$	3 0$\frac{1}{2}$	77 9	3 8$\frac{7}{8}$
„ 30	27·13	1 5	1 5	4·76$\frac{7}{16}$	2 11$\frac{3}{4}$	77 9	3 7$\frac{1}{4}$
Feb. 13	27·13	1 5	1 5	4·76$\frac{7}{16}$	Holiday	77 9	3 6$\frac{3}{4}$
„ 27	27·15	1 5	1 5	4·76$\frac{7}{16}$	2 11$\frac{1}{4}$	77 9	3 6$\frac{1}{2}$
Mar. 13	27·22	1 5	1 5	4·76$\frac{7}{16}$	3 0$\frac{1}{8}$	77 9	3 7
„ 27	27·24	1 5	1 5	4·76$\frac{7}{16}$	3 1$\frac{1}{4}$	77 9	3 9$\frac{5}{8}$
Apl. 10	27·15	1 5	1 5	4·76$\frac{7}{16}$	3 0$\frac{1}{2}$	77 9	3 9$\frac{1}{4}$
„ 24	27·14	1 6	1 6	4·76$\frac{7}{16}$	3 1$\frac{1}{2}$	77 9	4 1$\frac{1}{4}$
May 8	27·13	1 6	1 6	4·76$\frac{7}{16}$	3 1$\frac{3}{8}$	77 9	4 1$\frac{1}{8}$
„ 22	27·13	1 6	1 6	4·76$\frac{7}{16}$	3 1$\frac{1}{2}$	77 9	4 0$\frac{7}{8}$
June 5	27·14	1 6	1 6	4·76$\frac{7}{16}$	8 2	77 9	4 0$\frac{7}{8}$
„ 19	27·14	1 6	1 6	4·76$\frac{7}{16}$	2 2$\frac{7}{8}$	77 9	4 0$\frac{7}{8}$
July 3	27·14	1 6	1 6	4·76$\frac{7}{16}$	3 3$\frac{1}{4}$	77 9	4 0$\frac{13}{16}$
„ 17	27·14$\frac{1}{2}$	1 6	1 6	4·76$\frac{7}{16}$	3 3$\frac{3}{4}$	77 9	4 0$\frac{13}{16}$
„ 31	27·13	1 6	1 6	4·76$\frac{7}{16}$	3 4	77 9	4 0$\frac{13}{16}$
Aug. 14	27·09	1 6	1 6	4·76$\frac{5}{8}$	3 5$\frac{1}{2}$	77 9	4 0$\frac{13}{16}$
„ 28	26·18	1 6	1 6	4·76$\frac{9}{16}$	3 6$\frac{1}{4}$	77 9	4 1$\frac{1}{2}$
Sept. 11	26·07	1 6	1 6	4·76$\frac{1}{2}$	3 7$\frac{1}{4}$	77 9	4 1$\frac{1}{2}$
„ 25	26·42	1 6	1 6	4·76$\frac{9}{16}$	3 8	77 9	4 1$\frac{1}{2}$
Oct. 9	26·14	1 6	1 6	4·76$\frac{9}{16}$	3 4$\frac{1}{2}$	77 9	4 1$\frac{1}{2}$
„ 23	26·06	1 6	No sales	4·76$\frac{9}{16}$	3 3$\frac{3}{4}$	77 9	4 1$\frac{1}{2}$
Nov. 6	25·94	1 6	—	4·76$\frac{9}{16}$	3 3$\frac{3}{4}$	77 9	4 1$\frac{1}{2}$
„ 20	25·99	1 6	—	4·76$\frac{9}{16}$	3 3	77 9	4 0$\frac{3}{4}$
Dec. 4	25·97	1 6	—	4·76$\frac{7}{16}$	3 4	77 9	4 0$\frac{3}{4}$
„ 18	25·96	1 6	—	4·76$\frac{1}{2}$	3 4	77 9	4 0$\frac{7}{16}$

* December 31.

Vol. LXXXII.] [Part II.

JOURNAL

OF THE ROYAL STATISTICAL SOCIETY.

MARCH, 1919.

THE TAXATION OF THE VARIOUS CLASSES OF THE PEOPLE.

THE PRESIDENTIAL ADDRESS OF THE RIGHT HON. HERBERT SAMUEL, FOR THE SESSION 1918-19. DELIVERED TO THE ROYAL STATISTICAL SOCIETY, JANUARY 21, 1919.

I WOULD express my thanks to the Society for the distinguished honour which they have done me in electing me as their President. It is a pleasure, and in a sense a relief, to anyone who has been long immersed in the controversies of political life, to enter the more serene atmosphere of a Society such as this, and to take part in the work of a body of scientists, whose labours also serve, though in a different and a more placid way, the purposes of the State. I confess, however, that the diffidence which one would necessarily feel in undertaking this office is much increased by the fact that I follow a President who has rendered such great services to the Royal Statistical Society as Sir Bernard Mallet. Not only his position and experience as Registrar-General, but also his devotion to the interests of the Society and his energy in promoting them, have qualified him in an exceptional degree for the office which he has filled with distinction and success during the last two years He has set a standard which will be hard indeed for his successors to maintain.

During the first year and a half of the war this Society, in common with many other organizations, suffered in its membership; the number of its Fellows diminished in that period by 76. Since then, it is satisfactory to note, the numbers have shown no further diminution; the losses through death and resignation have been made good by fresh additions, and the number of new Fellows elected in 1918 was greater than in any of the last five years. It is very desirable that the membership of the Society should be further increased. With that object in view the Council have recently decided to enable Government Departments, Municipal Bodies, Libraries, Banks, Trading Companies and other corporations to associate themselves with the Society, and to suggest representatives to be submitted for election to fellowship. It is hoped that a number of such bodies will be ready to assist the Society's work, and it is believed that they will find its Library and its journal of service. I am glad to be able to mention that throughout the war and at the present time several Government Departments have made, and are making, frequent use of our Library, finding there publications the consultation of which is needed in their work, but which would not otherwise be available.

The last year has brought to the Society the loss of three of its most distinguished members. All three had taken a close interest in statistical science; all three had been Fellows of the Society for thirty years and upwards; all three had rendered good service to the nation in the House of Commons and, appointed to the House of Lords, had there continued their public work. Lord Brassey held the Presidency no less than forty years ago, and the Society had its full share in his large-minded interest in the institutions that seek to serve the national welfare. Lord Courtney was President in the years 1897–99; he won renown as an economist within this country and beyond; he commanded a widespread esteem as a public man of singular independence and purity of character. Lord Rhondda as an industrial leader, as a Parliamentarian, and, most recently, as the successful administrator, in a time of national peril, of a Government Department where success was vital to the safety of the country, but hardly to be hoped on account of the difficulties of the task, rendered distinguished service to the State. Rarely in all its long history has the Society had reason to deplore the loss in a single year of three men who had so fully deserved the high title of great citizens of their country.

Three more Fellows during the year, making five in all, have laid down their lives in the war. We will hold in honour their names:—Captain G. T. Loban, Lieutenant Harold P. Lubbock, Lance-Corporal M. I. Trachtenberg. Bishop Boyd-Carpenter was one of our valued members; Mr. R. M. Johnston, the Government Statistician of Tasmania, had been elected to an Honorary Fellowship of the Society; Mr. T. A. Welton became a Fellow so long ago as 1855, he was Guy Medallist in 1901 and a frequent contributor to the *Journal*.

During the last year, as in the years immediately preceding, the papers which have been read and the discussions which have taken place have been largely concerned, as was right, with some of the innumerable problems that have arisen from the war. It is one of those problems, not yet discussed before the Society, to which I would invite your consideration to-day.

Introductory.

The far-reaching effects of the War are nowhere more apparent than in our national finance. An immense burden of new debt has been incurred. The revenue has been multiplied nearly fourfold. Even if large indemnities are secured, it is probable that taxation will be far heavier in future than it was before the War. The time has come when an inquiry should be made into the allocation of the new taxation among the various classes of the people. The proposals in the Budgets of the last four years have been made by successive Governments, and have been sanctioned by Parliament, rather as the readiest means of raising, without excessive friction, the vast revenues that have been needed, than as the outcome of a careful study of the requirements of fiscal justice. It is essential, now that the War is over, that the bearing of these measures should be reviewed. There will be much discussion, in the days to come, of the lines on which post-war taxation ought to proceed and of the fairness or unfairness, as between class and class, of the existing taxes. But such a discussion, to be useful, ought to be preceded by an attempt to ascertain what the facts of the present situation really are, how much is being demanded by the State from the several strata of society, what proportion of their incomes is being taken in taxation from the rich, from the people of moderate means and from the working classes. We cannot say whether the burdens are justly distributed unless we first know what they are.

The subject, I would submit, is well qualified by its interest, its importance and its urgency, to engage the attention at the present time of the Royal Statistical Society. But in choosing it as the topic for the Presidential Address, I am fully conscious of its difficulty. On a number of points, particularly with regard to several of the indirect taxes, the material for exact statement is far from adequate. We are compelled to proceed largely by estimate. If this were not so, however, if the subject presented no difficulties, if the facts were easily ascertainable, we should find the allocation of taxation set out in the Blue Books, and there would be no need for this Society to trouble itself about the matter. Thiers unkindly said that statistics was the art of stating with precision what one did not know. I do not pretend that the conclusions reached in this paper are to be regarded as precise. But by collecting the facts, wherever facts are available, and by framing estimates, where we are obliged to have recourse to estimates, on as broad a basis of fact as possible, we may hope to reach results that will be serviceable. Those results cannot be free from error; they cannot claim acceptance in their details; but taken as a whole they will indicate, I believe, with substantial truth, the broad features of the situation.

I have been greatly assisted in my task by the help which has been freely extended to me by many experts on branches of the subject, both inside and outside the Public Departments. In particular, my predecessor in this Chair, Sir Bernard Mallet, K.C.B., the Registrar-General and formerly one of the Inland Revenue Commissioners; Mr. H.V. Reade, C.B., the Principal of the Statistical Office of the Board of Customs and Excise; and Dr. J. C. Stamp, C.B.E., of the Board of Inland Revenue, have been good enough to give me assistance which has been invaluable. I would wish to present my acknowledgments also for information or advice on particular points to Mr. G. E. Murray, C.B., and Sir Charles A. King, K.C.B., of the General Post Office; Mr. C. L. Stocks, of the Treasury; Dr. Stevenson, C.B.E., of the General Register Office; Professor Bowley; Professor W. R. Scott; and Mr. J. S. Eagles, the Secretary of the recent Committee on the Cost of Living of the Working Classes.

Scope and Method of the Inquiry.

I have taken as the terminal of my inquiry the rates of taxation in the present financial year 1918–19. This involves accepting, for the yield of most of the indirect taxes, the Budget estimates and not the figures of actual collection. But Budget estimates are seldom very far wrong. I am informed that the only miscalculation of importance this year is likely to be in the yield of the tobacco duty, and I have added, in accordance with a more recent estimate, 3,000,000*l.* under that head. If the previous year had been chosen, the important alterations made by the Finance Act, 1918, in the rates of income-tax, super-tax, beer and spirit duties and other taxes would not have been taken into account, and my conclusions would have been out of date before they had been formulated.

In order to show the trend of War finance, I have taken for comparison the last complete fiscal year before the War, 1913–14.

And I have thought it would be of interest to take a second point of comparison some years earlier, in order to assist the investigation of the course of pre-war policy in matters of taxation. For this purpose I have gone back another decade and have selected the year 1903–04. The disturbances in the rates of taxation due to the immediate effects of the South African War were over by then, and the important fiscal changes effected by the Parliaments of 1905–10 had not begun. The year 1904, also, was that in which the Board of Trade made their collection of household budgets, which was at that time, and which still remains, the chief source of information on the working-class consumption of certain taxed articles.

All my figures relate, therefore, to the three years 1903–04, 1913–14 and 1918–19.

The incomes selected for comparison should be fairly typical of all classes of the community, without being so numerous as to make the statistical tables unduly elaborate. I have aimed at estimating the taxes payable on family incomes of the following amounts: 50*l.*, 100*l.*, 150*l.*, 200*l.*, 500*l.*, 1,000*l.*, 2,000*l.*, 5,000*l.*, 10,000*l.*, 20,000*l.*, and 50,000*l.* For the present year, however, I have omitted the income point of 50*l.*, as families with a wage of 1*l.* a week are now very exceptional and the retention of that figure would give a misleading impression. Income, above the lower points, is taken to be income as assessed for purposes of income-tax.

The comparison must obviously be on a basis of families, but the question arises whether the number of persons to be taken as constituting a family should be uniform throughout, or whether an allowance should be made for the fact that families are larger among the poorer classes than among the more well-to-do. The latest information on this point has been furnished by the Treasury Committee on the Cost of Living, over which Lord Sumner presided. That Committee collected—in June and July, 1918—facts as to expenditure on food, and other statistical matter, relating to 1,306 families. It was found that there would be great difficulty in obtaining accurate statements as to income, particularly on account of the complications of supplementary earners, overtime and irregular work. The families were classified therefore by occupation only. The facts as to the average number of persons in a family do not show a quite regular scale, but they are significant. They are as follows:

Class.	Average number of persons per family.
Unskilled	6·0
Semi-skilled	5·3
Skilled	5·5
Clerks	4·6

The Board of Trade, in the summer of 1904, collected the well-known series of household budgets relating to 1,944 families in urban districts in the United Kingdom. These were classified according to income, and at first sight seem to show that the higher the grade of labour the larger the family; until it is remembered that the larger family is more likely to contain children old enough to earn than the family with two or three children, and that higher family earnings may be due to the presence of one or more supplementary wage-earners. Professor Bowley, who has examined the original figures on which the summary table is based, tells me that this is undoubtedly the cause of the apparent discrepancy. The facts ascertained in the 1901 inquiry are as follows:

Weekly income.	Average income.	Average number of persons per family.
	s. *d.*	
Under 25*s.*	21 4½	5·1
25*s.* and under 30*s.*	26 11¾	5·3
30*s.* and under 35*s.*	31 11¼	5·2
35*s.* and under 40*s.*	36 6¼	5·4
40*s.* and above	52 0½	6·4
Average of all incomes	36 10	5·6

The census of 1901 showed the average family to consist of 4·62 persons, and the census of 1911, 4·51.

On the whole it seems better, for the purposes of this inquiry, to take throughout a fixed number for a typical family than to attempt to differentiate on this point between classes. The data for such a differentiation are insufficient. It would involve complicating our tables by distinguishing, as regards an income of 150*l.* for example, between the taxation that would be paid by an artisan and by a clerk, each earning that sum, but the family of the one containing one more person than the family of the other, and therefore consuming a larger quantity of dutiable goods. Further, for purposes of income-tax allowances, it is necessary to consider families with a definite number of children, and it would be inconsistent to adopt one course when we are dealing with indirect taxation, and another when we are dealing with direct. On these grounds, this inquiry relates uniformly to families of two adults and three children. It must be remembered, however, that the consequence will be to show a somewhat smaller rate of taxation at the lower grades of income than is actually paid, because the average family in the labouring classes is larger than five. In the case of the higher incomes, where the whole amount of indirect taxation is small compared with direct, the effect of the difference is too slight to be noticeable.

I have followed all previous investigators in assuming that the taxes on commodities are paid by the consumer.

But the question has to be determined whether, in the case of the servant-keeping classes, the taxes on the tea and sugar and other dutiable commodities consumed by the servants are to be regarded as a burden on the employer or not. It is clear that in the short run any addition to the tax falls upon the employer. When in 1904, for example, the tea duty was increased from 6*d*. to 8*d*. per lb., followed by a return in the following year to 6*d*. and by a reduction in 1906 to 5*d*., it is probable that, while the increase in the duty lasted, it was borne wholly by the employer, unless indeed the consumption of tea by domestic servants declined proportionately —a most unlikely supposition. But over a longer period the incidence of such taxes is different. The remuneration of the servant consists of money wages, of food and of lodging. Its amount depends upon the rate of remuneration obtainable in other employments, after allowance is made for the amenities, or for the drawbacks, attaching to domestic service. The value of the wages, the food and the lodging must be considered as a whole. If food doubled in cost in working-class homes, that fact could not be without its influence in fixing the amount of money wages which a servant would be willing to accept on leaving her home. It would also have an influence on the amount of money wages which an employer would be willing to pay, since he knows that the additional cost of the servant's food would fall upon him. The matter is seen most clearly if we take the analogous case of the farm labourers in the North of England, some of whom are boarded and lodged by the farmers, and some of whom have cottages of their own. It is plain that the cost to the employer of the food of the hind, who lives in, comes into the calculation when his wages are being fixed in comparison with those of the labourer who lives out. And where the cost of food rises, no distinction can be made, from this standpoint, between a rise due to increased taxation and a rise due to a greater cost of production, or other similar causes.

I reach the conclusion, therefore, that in the long run the servant who lives in her employer's house, as much as her sister who works in a factory outside, is adversely affected by an increase in the cost of food due to its taxation ; and although for a time the effect is different, I have proceeded on that assumption in this paper. It presents with greater accuracy the more permanent effects of the existing rates of taxation. The point is one on which economists will differ ; but of the five who have been good enough to tell me their views as to the incidence of these taxes, four hold the general view which I propose to adopt. Professor Marshall also has expressed the same opinion in his recent essay on "National Taxation after "the War," though he makes the qualification that in so far as domestic servants' consumption of dutiable articles is larger than is usual in the class from which they come, the employer may be considered as paying the taxes on that extra consumption.[1]

I use the term Tax in the ordinary acceptation of the word, as meaning the sum compulsorily taken from the subject into the national Treasury for the public service. I have not attempted to allocate the burden of the local rates. The results of such an inquiry would throw little light on the new problems that arise from war taxation. Although local rates have, no doubt, increased during the war, and sometimes by a considerable proportion, the amount of the increase has been almost insignificant compared with the rise in the national taxes. Further, there is far less agreement among economists as to the real incidence of local rates than there is as regards the greater part, at least, of the national taxes; and it is advisable not to enlarge the scope of our inquiry at the cost of importing fresh controversy on this aspect of the question. I do not include among taxes the compulsory contribution of employers and employed to the National Insurance Funds, for the Exchequer does not receive them and derives no revenue from them.

The subject may be mulcted by the action of the State in other ways than by the levying of taxes. The creation of new credits during the war, by lowering the value of money and raising the cost of living, has imposed a burden which may in many cases be much heavier than any that is due to the new taxation. But here, again, no revenue is in question. The expansion of the paper currency stands on much the same footing. If, indeed, that expansion had been effected in this country, as it has been in Russia and elsewhere, by printing paper money in order to make Government payments, the money so provided would have been in the nature of revenue obtained from the community, and obtained in the worst possible way. But that has not been the process in the United Kingdom, where paper currency has been issued only on demand from the banks, and in exchange for gold or securities. Its expansion has been more the consequence than the cause of the creation of credits and the rise of prices.

In some cases, where the Government has been itself conducting commercial transactions, as in the control, for example, of shipping or of wool, there may be a profit from its transactions. But it is intended that any such profit should be only temporary. The principle has been laid down that the accounts, at the end, should balance as nearly as may be, and that the Exchequer should make neither a profit nor a loss from the State control of trades or industries.

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[1] *After War Problems*, by the Earl of Cromer and others, p. 327 n.

It would be beyond the scope of this inquiry to examine the objects upon which the national revenue is spent, and to attempt to assess the benefits which each class derives from them. In some cases the benefit is direct and easily ascertainable—for example, the expenditure upon the bread subsidy or Old Age Pensions. But the relative advantages derived by different classes from the great bulk of our present expenditure, which is incurred for military and national objects, cannot be computed. Nor is it reasonable to say that the sums spent on the elementary schools, for instance, benefit only the families whose children are educated in those schools, and are of no advantage to employers of labour or to other classes. These are separate problems, into the discussion of which I do not propose to invite you to embark.

In the revenue itself there are certain items which we are obliged to exclude from our calculations. Some are not taxes at all—the revenue, for example, from Crown lands and from the Suez Canal shares belonging to the British Government. Some, such as the Stamp Duties, cannot be allocated to families receiving specified incomes. The Stamp Duties are paid almost entirely, indeed, by the middle and wealthy classes as distinguished from the working-classes; but they are contributed so unevenly by the individuals within those sections that it is useless to attempt to estimate the share of each, and it would be misleading to strike an average. I place the Liquor Licence Duties in the same category. Although there is much to be said for regarding them in the long run as part of the general taxation of alcoholic liquor, and therefore paid by the consumer, opinions are divided on this point, and it would be safer to omit them from our allocation. The following table shows the taxes excluded on these and similar grounds, and their yield in the three selected years. The figures for 1918–19 are those officially given of the estimated yield in a full year of the taxes now in force. The actual yield in the present year is expected to be slightly different in some cases. The large item of 15,200,000*l.* under the head of Miscellaneous Revenue in the year 1918–19 includes Mint receipts, sundry contributions to the cost of the war, receipts in connection with the Vote of Credit, and surplus balances on the Currency Note Investment Reserve Account. None of these can be regarded as taxation that can be attributed to individuals or classes.

Heads of revenue excluded (million £).

	1903-04.	1913-14.	1918-19.
Stamps	7·07*	9·98	9·50
Land tax	0·74	0·69	0·65
Land value duties	—	0·71	0·70
Crown lands	0·46	0·53	0·65
Suez Canal shares and sundry loans	0·98	1·57	6·00
Coal export duty	2·05	—	—
Railway passenger duty	0·35	0·28	—
Liquor licences	2·23	4·51	1·12
Other licences	2·05	1·20	0·89
Motor spirit duty	—	0·82	1·35
Clocks and watches (imported)	—	—	0·45
Motor cars and cycles (imported)	—	—	0·10
Musical instruments (imported)	—	—	0·05
Miscellaneous	1·60	2·30	15·20
	17·54	22·60	36·66

* Excluding patent medicines.

Far more important than any of these heads of revenue is the Excess Profits Duty, estimated to yield in the present financial year 300,000,000*l*. It is impossible to include this in our calculations, because its real incidence cannot be determined, nor can the payment be apportioned among classes of incomes; and it is not necessary or, indeed, desirable that it should be included, for if the Excess Profits Duty proves to be, as was intended, a temporary tax, its allocation would throw no light on post-war financial problems; added now, it would have to be deducted again, whenever our conclusions were used as the basis for the discussion of the fiscal situation under normal conditions.

The revenue dealt with in this paper differs from the revenue included in the official returns in one other particular. For reasons which will be stated later, the Post Office profit is included as being in the nature of a tax. The official figures include not only the profit, but the whole of the gross revenue of the Post Office. The amount of revenue covered by this inquiry is therefore as follows :—

Amount of revenue included (million £).

	1903–04.	1913–14.	1918–19.
Total national revenue	151·34	198·24	845·05
Add additional yield in a full year of taxation at the rates of 1918–19	—	—	46·70
Post office profit	4·30	6·20	6·00
	155·64	204·44	897·75
Deduct Post Office gross revenue	19·15	30·80	38·00
Taxes specified in previous table	17·54	22·60	36·66
Excess profits duty....	—	—	300·00
	36·69	53·40	374·66
Revenue included	118·95	151·04	523·09

I proceed now to examine, in the light of the principles that have been stated, the amounts contributed to this revenue by the several classes of incomes.

DIRECT TAXATION.

Income-tax and super-tax.

In the first of our selected years—1903–04—the income-tax was comparatively simple. There was a uniform rate of 11*d.* in the £. The only modification to be made was in relation to the abatements at the lowest points in the scale. The tax paid was as follows:—

1903-04.

Income.	Tax.	Income.	Tax.	Income.	Tax.
£	£ *s.* *d.*	£	£ *s.* *d.*	£	£ *s.* *d.*
200	1 16 8	2,000	91 13 4	20,000	916 13 4
500	16 0 10	5,000	229 3 4	50,000	2,291 13 4
1,000	45 16 8	10,000	458 6 8		

By 1913–14 the system had been subjected to many alterations. There was first the differentiation between earned income and unearned up to 2,000*l.* It will be necessary to give figures of the tax paid on each kind of income. Where the income is partly earned and partly unearned the amount of tax paid would lie between the two. There was next the allowance in respect of children. As they may be of interest I shall give, for the purposes of this and the next tables only, alternative figures for a tax-payer without children, as well as the figures for the typical family of two adults and three children. There was, thirdly, the introduction of the super-tax upon incomes over 5,000*l.* The taxes payable were as follows:—

1913–14.

Income.	Earned income.		Unearned income.		Super-tax.	Total income tax and super-tax.
	No children.	Three children.	No children.	Three children.		
£	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£ *s.* *d.*	£	£ *s.* *d.*
200	1 10 0	7 6	2 6 8	0 11 8	—	—
500	13 2 6	12 0 0	20 8 4	18 13 4	—	—
1,000	£37 10 0		£58 6 8		—	—
2,000	75 0 0		116 13 4		—	—
5,000	£291 13 4				—	—
10,000	583 6 8				175	758 6 8
20,000	1,166 13 4				425	1,591 13 4
50,000	2,916 13 4				1,175	4,091 13 4

In 1918–19 the recipient of an income of 150*l.* has become liable to pay the tax for the first time in the years we have selected. The children's allowance has been increased in amount and the principle has been extended to wives. I shall assume that the man with three children has a wife also. Super-tax begins on incomes above 2,500*l.* The rates of both taxes have been greatly increased, and the income-tax has been graduated, not only by means of abatements, but also by a differentiated scale. The amounts payable are as follows:—

1918–19.

Income.	Earned income.		Unearned income.		Super-tax.	Total income tax and super-tax.
	No family.	Wife and three children.	No family.	Wife and three children.		
£	£ *s.* *d.*	£ *s.*	£ *s.*	£ *s.* *d.*	£ *s.*	£ *s.*
150	3 7 6	—	4 10	—	—	—
200	9 0 0	—	12 0	—	—	—
500	45 0 0	33 15	60 0	45 0 0	—	—
1,000	150 0 0	146 5	187 10	182 16 3	—	—
2,000	£450		£525		—	—
5,000	£1,500				287 10	1,787 10
10,000	3,000				1,187 10	4,187 10
20,000	6,000				3,437 10	9,437 10
50,000	15,000				10,187 10	25,187 10

Death Duties.

The allocation of the burden of the Death Duties presents obvious difficulties. The Death Duties cannot be omitted from our computation as though no-one paid them; they are in fact a charge upon the property-owning classes, whose incomes, if there were no Death Duties and if other things were equal, would be greater than they now are. So far as the Estate Duty is concerned, the yield of which is about three-fourths of the whole, the fairest method of allocation appears to be that adopted in a Parliamentary question on July 11, 1918, to the Chancellor of the Exchequer, and in his reply. The charge in respect of Estate Duty was there regarded as equivalent to the average annual life insurance premiums which a person of the age of 40 would have to pay in order to provide at death the amount of duty to which his estate would be liable. The income in each case was taken to be 5 per cent. of the capital. If, instead of adopting this method, the Estate Duty were regarded as a deduction from the capital of the inheritors of the property, and therefore as an equivalent diminution of their income, the burden of the tax on the income that remained would be heavier. And if a sinking fund were included to replace the capital that had been taken in Estate Duty, the burden would be heavier still. The method adopted here puts the charge in respect of Estate Duty at its lowest.

Of the other Death Duties the only one which yields an amount exceeding 1,000,000*l.* is the Legacy Duty, which brought in close upon 5,000,000*l.* in 1917–18. This tax varies according to the degree of relationship of the legatee to the deceased person, and is not uniform, therefore, with respect to estates of equal amount. It would not be right to exclude it from calculation, and the fairest method of allocating it would be to regard it as being, on the average, equivalent to an addition to the Estate Duty. This method is open, no doubt, to criticism, but in any event the sums involved are not large enough to make any considerable difference in the total of the taxes payable by particular incomes. The addition to be made to the Estate Duties in order to arrive at the total for all the Death Duties would be 30 per cent. in 1903–04 and 25 per cent. in 1913–14 and 1918–19.

Death Duties can best be regarded as a charge upon unearned, and not upon earned, incomes, and this principle was adopted in the Parliamentary question and answer to which I have referred. Taking the figures given in that answer for 1918–19, and applying the same principles to the earlier years, we arrive at the following tables:—

	Income.	Equivalent estate.	Rate of estate duty.	Estate duty payable.	Add other death duties.	Total death duties payable.	Average insurance premium (starting age 40) necessary to provide death duties.		Equivalent rate of income tax.
					At 30 per cent.				
	£	£	Per cent.	£	£	£	£	s.	d.
1903-04	200	4,000	3	120	36	156	4	7	5¼
	500	10,000	3	300	90	390	10	18	5¼
	1,000	20,000	4	800	240	1,040	29	2	7
	2,000	40,000	4½	1,800	540	2,340	65	10	8
	5,000	100,000	5½	5,500	1,650	7,150	200	4	9½
	10,000	200,000	6	12,000	3,600	15,600	436	16	10½
	20,000	400,000	7	28,000	8,400	36,400	1,019	4	12½
	50,000	1,000,000	7½	75,000	22,500	97,500	2,730	0	13
					At 25 per cent.				
1913-14	200	4,000	3	120	30	150	4	4	5
	500	10,000	4	400	100	500	14	0	6
	1,000	20,000	5	1,000	250	1,250	35	0	8½
	2,000	40,000	6	2,400	600	3,000	84	0	10
	5,000	100,000	8	8,000	2,000	10,000	280	0	13
	10,000	200,000	10	20,000	5,000	25,000	700	0	17
	20,000	400,000	11	44,000	11,000	55,000	1,540	0	18½
	50,000	1,000,000	14	140,000	35,000	175,000	4,900	0	23½
					At 25 per cent.				
1918-19	200	4,000	3	120	30	150	4	4	5
	500	10,000	4	400	100	500	14	0	6
	1,000	20,000	5	1,000	250	1,250	35	0	8½
	2,000	40,000	6	2,400	600	3,000	84	0	10
	5,000	100,000	9	9,000	2,250	11,250	315	0	15
	10,000	200,000	11	22,000	5,500	27,500	770	0	18
	20,000	400,000	15	60,000	15,000	75,000	2,100	0	25
	50,000	1,000,000	19	190,000	47,500	237,500	6,650	0	32

Inhabited house duty.

It is a rapid descent from the large sums relating to Income-Tax, Super-Tax and Death Duties, to the humbler figures of the Inhabited House Duty, but since the incidence of that tax on the various incomes can be fairly well allocated, it is desirable to add them. Dr. Stamp, who has made a close study of this matter, as the readers of the Third Chapter of his book, "British Incomes and Property," will know, has been good enough to make an estimate for me of the probable amount of Inhabited House Duty paid on the average by the tax-payers on our scale. The amount of the duty has not been changed during the period under review. The tax is not levied in Ireland. The estimated payments are as follows:—

Income.	Tax.	Income.	Tax.	Income.	Tax.
£	£ *s.* *d.*	£	£ *s.* *d.*	£	£ *s.* *d.*
50	Nil	500	1 5 0	10,000	15 0 0
100	Nil	1,000	3 0 0	20,000	28 0 0
150	0 4 6	2,000	4 15 0	50,000	55 0 0
200	0 7 6	5,000	9 0 0		

INDIRECT TAXATION.

The computation of the indirect taxes paid by the several classes depends upon the ascertained figures of the consumption of dutiable goods. Every student of this subject would desire that the available material had been less scanty. This Society would have rendered useful service had it been able to secure a comprehensive inquiry from time to time into the facts. Perhaps, however, it has been deterred by the fear of incurring criticism such as that expressed by Tom Hood in his "Tale of a Trumpet," where he says of the inquisitive old lady who was the heroine of his story—

> "In fact she had much of the spirit that lies
> Perdu in a notable set of Paul Prys,
> By courtesy called Statistical Fellows—
> A prying, spying, inquisitive clan,
> Who have gone upon much of the self-same plan,
> Jotting the labouring class's riches;
> And after poking in pot and pan,
> And routing garments in want of stitches,
> Have ascertained that a working man
> Wears a pair and a quarter of average breeches!"

Happily for our present purpose, Government Departments have not been so sensitive. Our chief source of information is the collection of nearly 2,000 household budgets made by the Board of Trade in 1904, to which reference has already been made. In 1908 the Board of Inland Revenue, which was then responsible also for Excise, collected some valuable facts relating to the consumption of dutiable articles by working-class families. The Board of Customs and Excise, to which the Excise Department was shortly afterwards transferred, has been good enough to allow me access to the results of that inquiry. The facts related to 225 families, and were collected from shop-keepers with respect to all articles except alcohol, with regard to which information was obtained from publicans; inquiries were made from publicans also with regard to tobacco. For 1918 we have the statistics collected by the Sumner Committee from 1,306 families.

Tea.

1903–04.—The Board of Trade figures of 1904 show the quantity of tea consumed weekly by families, the size of which varies at different wage points. Taking the wage rates given in the 1904 table—which are the nearest to our income points of 50*l.*, 100*l.* and 150*l.* a year—and transforming the figures from weekly to annual, and from families of varying numbers to uniform families of five, we arrive at the following table:—

Average weekly income.	Annual consumption of tea per family of five.
s. *d.*	lbs.
21 4½	24·45
36 6¼	28·40
52 0½	29·45

In the tabulated results of the Excise inquiry of 1908, the first column gives the average annual consumption of 18 families, 5·3 persons per family, income 19*s.* 6*d.* a week. With respect to tea this was 30 lbs., equivalent to 28·3 lbs. for a family of 5. In 1903 and 1904 the national consumption of tea per head was 3 per cent. less than in 1908. Assuming that all classes of the population had contributed uniformly to the increase, we must reduce the 1908 figure by 3 per cent. when we apply it to our selected date 1903–04. This would give a figure of 27·5 lbs. for incomes of 19*s.* 6*d.*

The Board of Trade budgets indicated, as we have seen, a consumption of 24·45 lbs. of tea by families with incomes of 21*s.* 4½*d.* The reason for the higher figure in the Excise table is clearly that the families with the lowest incomes chosen for the purposes of that inquiry were stated to belong to the agricultural labouring classes; all the families that furnished budgets to the Board of Trade investigators in 1904 lived in urban districts. An income of 1*l.* a week at that time allowed in the village a standard of comfort which would permit a somewhat larger expenditure on articles such as tea than would be possible for a family living in a town, who, with the same income, would be sunk in poverty. If we take an average of the two figures we shall arrive at the conclusion that a family with 50*l.* a year (or 19*s.* 3*d.* a week) consumed tea at the rate of 26 lbs. per annum in the year 1903–04.

Coming to the next income point, we find that the 1904 budgets indicate an annual consumption of 28·40 lbs. of tea for families of 5 with incomes averaging 36*s.* 6¼*d.* The Excise inquiry of 1908 would indicate a comparable figure for 1903–04 of 27·51 lbs. per family with average incomes of 33*s.* 6*d.* We may take a figure of 28·5 lbs. as the consumption of a family with 100*l.* a year, or 38*s.* 6*d.* per week.

With respect to our third income point, the budgets of 1904 indicate a consumption of 29·45 lbs. for families with an average of 52*s.* 0½*d.*; the Excise inquiry would give 30·20 lbs. for families with 61*s.* 6*d.* The earlier inquiry included 596 families in this group, the later inquiry only 12. We may attribute a consumption of 30 lbs. to a family with 150*l.* a year, or 57*s.* 9*d.* a week.

There remains to be considered the consumption of the classes with higher incomes. The national consumption per head in 1904 was 6·02 lbs. The average working-class consumption as shown by the 1904 budgets was 5·57 lbs. The Excise inquiry indicates a working-class consumption for that year of 5·82 lbs., but the number of families included was only one-eighth of that covered by the earlier inquiry, and the information was probably not quite so reliable. It will be safer to accept the lower figure. The proportion of the working-classes to the whole population has been taken by Mulhall, by Professor Leone Levi and by Mr. Sanger, at 70 per cent., a figure which was also adopted by Sir Bernard Mallet in his investigations on this subject in 1902 and 1904. If the whole population consumes at the rate of 6·02 lbs. per head per annum, and 70 per cent. consume at the rate of 5·57 lbs., then the remaining 30 per cent. will consume at the rate of 7 lbs. The Board of Customs and Excise prepared an estimate for the Chancellor of the Exchequer in 1915 which shows a close approximation to this figure. It would indicate, allowing for the less consumption in 1903–04, a consumption of 7·5 lbs. per head at an income of 200*l.* to 300*l.* There is every reason to believe that the consumption by families with incomes higher than these is not appreciably larger.

The tea duty in 1903–04 was 6*d*. per lb. We therefore reach these figures :—

1903–04.

Income.	Annual consumption of tea per family of five.	Tax.
£	lbs.	*s*. *d*.
50	26	13 0
100 ..	28·5	14 3
150	30	15 0
200 and above	35	17 6

1913–14. No additional facts are available with respect to the actual consumption of households in the period 10 years later. But the national average had increased by 11 per cent. to 6·68 lbs. per head.

It is true that the increased consumption of 11 per cent. was probably not distributed uniformly over all the classes of the population. There is evidence to show that variations in the consumption of the chief dutiable articles are correlated with variations in the real wages of the working-classes. The retail price of tea was about the same in 1913 as in 1903. The Board of Trade index number of the price in London is the same in both years. With respect to the movement in the real wages of the working-classes, index numbers for 1860 to 1902 were calculated by Mr. G. H. Wood, and published in the JOURNAL of this Society in March, 1909; they have since been continued by Mr. A. D. Webb, of the Customs and Excise Department. Those index numbers are based upon the year 1850 as a standard, taking 100 for that year for men in full work, and 96 after making an allowance for unemployment. They show an average for the three years 1902–04 of 166·3, and for the three years 1912–14 of 168, a very small difference. Although, therefore, the 11 per cent. increase in the consumption of tea was probably due in a somewhat larger degree to purchases by those members of the working-classes who were in a better position than formerly to satisfy their wants, the departure from uniformity is likely to have been small, and it is not worth while to attempt to discriminate with regard to this 11 per cent. between the classes of the population.

The tea duty in 1913–14 was 5*d*. per lb. The table for that year would be as follows :—

1913-14.

Income.	Annual consumption of tea per family of five.	Tax.
£	lbs.	*s. d.*
50	28·9	12 0
100	31·6	13 2
150	33·3	13 10
200 and above	38·9	16 2

1918–19.—When we come to the present year the situation with respect to this, as to all other questions of consumption, is affected by the restriction of supplies due to war conditions. The amount of tea available for distribution is 2 ozs. per head per week. This is 6·5 lbs. per annum, or nearly as much as the average consumption in the year before the war, and more than the consumption in any previous year. The actual consumption in working-class families was less than this before the war, and with present prices may be expected to be less than this now. We are fortunate in possessing the very recent information on this and analogous matters, furnished by the Sumner Committee on the Cost of Living of the Working Classes. As already mentioned, their classification of families was not according to wages, but I am informed that the investigations show that the unskilled class corresponds to a present-day income of about 150*l.*, and the skilled to an income of about 200*l.* The results of the Sumner Inquiry are as follows, a column showing the equivalent amounts per family of 5 per annum being added :—

	Consumption of tea per head per week.	Do. per family of five per annum.
	oz.	lbs.
Unskilled	1·4	22·7
Semi-skilled	1·7	27·6
Skilled	1·7	27·6
Working-class average	1·6	26·0
Clerks	1·5	24·4

We must attribute to an income of 100*l.* a somewhat lower consumption than that of an income of 150*l.*, and may assume it to be 20 lbs. Families with 500*l.* and above may be taken to consume their full tea ration of 32·5 lbs. a year. The present rate of tea duty is 1*s.* Omitting, for the reason given earlier, the income point of 50*l.*, we arrive at the following table for the present year[1]:—

1918-19.

Income.	Annual consumption of tea per family of five.	Tax.
£	lbs.	£ *s.* *d.*
100	20	1 0 0
150	22	1 2 0
200	27·6	1 7 7
500 and above	32·5	1 12 6

Sugar.

1903–04.—Adopting the same process as in the case of tea, we find that the Board of Trade budgets of 1904 indicate the following rates of consumption of sugar:—

Average weekly income.	Annual consumption of sugar per family of five.
s. *d.*	lbs.
21 4½	197
36 6¼	251
52 0½	256

The Excise figures of 1908 for the nearest points on the wage scale are as follows:—

Average weekly income.	Average number of family.	Annual consumption of sugar.
s. *d.*		lbs.
19 6	5·3	271
33 6	5·8	337
61 6	7·2	338

The national consumption of sugar per head frequently shows considerable fluctuations in particular years; it would be safer to take the average of the three years 1903–05. This was 72·13 lbs. In 1907–09 the average consumption was 78·92 lbs. The consumption per head at the earlier date was less than that at the later date by 8·6 per cent. These figures of national average include all sugar, refined or unrefined, whether purchased as sugar or after manufacture into jam, marmalade, confectionery, etc.; while the figures of the household budgets which have been quoted relate only to sugar bought as such. We may, however, safely assume the same proportionate difference in consumption between the two dates in the one case as in the other. The Excise figures of 1908 would therefore indicate a consumption of sugar as such in 1904 per family of 5 as follows :—

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[1] Later estimates show that, owing to the conclusion of the armistice and other causes, the consumption of tea, and the taxes paid, will be somewhat larger this year than the table indicates.

Average weekly income.	Annual consumption.
s. *d.*	lbs.
19 6	234
33 6	266
61 6	216

As in the case of tea, and doubtless for the same reason the consumption at the lowest wage point is higher in the Excise budgets than in those collected by the Board of Trade. We may take, again, an average of the two, and we reach for a family with 50*l.* a year a consumption of 216 lbs. of sugar in 1903–04.

At the next income points there is, again, a divergence between the two sets of figures, though smaller in extent. The 1904 figures were based upon the budgets of nearly four times as many families of these incomes as the figures of 1908, and are not subject to the disturbance due to the allowance for the difference of date. It will be safer to rely on the 1904 budgets in case of doubt, and to put the consumption of sugar for a family with an income of 100*l.* a year, or 38*s.* 6*d.* a week, at 255 lbs.

Similarly with the next income point, where the 1908 figures, based on only 12 families, are clearly unreliable. We may estimate the figure for an income of 150*l.* a year at 260 lbs.

With regard to the higher incomes, the Board of Customs and Excise estimate in 1915 for families of 5 with incomes of 200*l.* to 300*l.* was put in round figures, based on the data ascertained in 1904, at 5 lbs. per week, or 260 lbs. a year. The figure for 1903–04 cannot be put at less than that. We can now frame the following table :—

1903–04.

Income.	Annual consumption of sugar as such per family of five.
£	lbs.
50	216
100	255
150	260
200 and above	260

To this must be added a percentage in order to include the sugar consumed in jam, marmalade, treacle, syrup, etc. The budgets of 1904 indicated a fairly constant ratio in the expenditure on these articles, compared with the expenditure upon sugar as such, throughout the range of incomes covered by that inquiry From the particulars there given it may be calculated as follows:—

Average weekly family Income.	Ratio of expenditure on jam, &c., to expenditure on sugar.
s. *d.*	per cent.
21 4½	53
26 11¾	52·5
31 11¼	54
36 6¼	58
52 0½	58
36 10 (general average)	55

The difference between the lowest wage points and the highest is only one-tenth. The amount of additional sugar consumed in jam, etc., by one class as compared with another, would be in about the same proportion as their additional expenditure. The national consumption of all forms of sugar on the average of the three years 1903–05 was 360 lbs. per family of 5. The figures deduced from the household budgets indicate an average national consumption of sugar as such of about 255 lbs. per family of 5. The addition to be made in respect of jam and other commodities would therefore be 105 lbs., or 40 per cent. At the lower range of incomes it would be somewhat smaller, and at the higher range somewhat larger. The duty in 1903–04 was 4*s.* 2*d.* per cwt. We may estimate the consumption and tax as follows:—

1903–04.

Income.	Annual consumption of sugar (all forms) per family of five.	Tax.
£	lbs.	*s.* *d.*
50	300	11 2
100	357	13 3
150	370	13 9
200 and above	380	14 1

1913–14.—The average consumption of all forms of sugar per head in the calendar year 1914 was 79·80 lbs. The figures for 1915 are affected by the war, so that we cannot take in this case the average of the selected year with the previous and the subsequent year. The figure for 1914 was an increase on the average for 1903–05 of 7·67 lbs., or a little over 10 per cent. Adding this percentage to our previous figures, and allowing for the tax at the reduced figure of 1*s.* 10*d.* per cwt., we reach the following figures :—

1913-14.

Income.	Annual consumption of sugar (all forms) per family of five.	Tax.
£	lbs.	*s.* *d.*
50	330	5 5
100	393	6 5
150	407	6 8
200 and above	418	6 10

1918–19.—The rationed allowance of sugar is ½ lb. per week per person, and the investigations of the Sumner Committee show that this, within a small fraction, is the actual consumption. Their figures are as follows :—

	Consumption of sugar per person per week.
	lbs.
Unskilled	·52
Semi-skilled	·50
Skilled	50
Clerks	·47

The consumption of the wealthier classes can be no higher. The tables of the Sumner Committee give also the weekly expenditure upon jam and syrup per "standard family," as defined in their Report. It is as follows :—

	Weekly expenditure upon jam and syrup per "standard family."
	s. *d.*
Unskilled	1 7½
Semi-skilled	1 11½
Skilled	2 2
Clerks	2 3

These figures indicate that the better paid working-class families and the lower middle classes consume nearly 40 per cent. more of these articles than the unskilled labourer class. If an addition is made in respect of confectionery, condensed milk, mineral waters, etc., it would probably be nearly 50 per cent. more. This approximates closely to the figures reached by our separate calculation for the pre-war ratio in 1903–04 and 1913–14.

The Budget estimate of the Board of Customs and Excise was based upon a consumption of sugar in 1918–19 of 50 lbs. per head. The consumption of sugar as such is uniformly 26 lbs. throughout the population. The remaining 24 lbs. is consumed in varying proportions, the higher incomes taking about 50 per cent. more than the lower. The sugar duty has been raised to 25*s.* 8*d.* per cwt., fourteen times its pre-war figure. The table for 1918–19 will be:—

1918–19.

Income.	Consumption of sugar per family of five.			Tax.
	Sugar as such.	In jam, etc.	Total.	
	lbs.	lbs.	lbs	£ *s.* *d.*
100	130	90	220	2 10 5
150	130	120	250	2 17 3
200	130	135	265	3 0 9
500 and above ...	130	140	270	3 1 10

Tobacco.

The data with respect to the consumption of tobacco are fewer than those relating to the commodities with which we have hitherto been dealing. The 1904 inquiry of the Board of Trade dealt with food-stuffs only, and gives us no information as to tobacco. There are a few facts in the budgets collected by the United States Commissioner of Labour in 1890, by the Economic Club in 1891–94, and by Mr. Seebohm Rowntree in 1899; but the number of budgets is so small and the diversities of the results are so large, that no useful conclusion can be drawn from them. The Excise inquiry of 1908 yielded the following information:

Family income.	Consumption of tobacco per annum.
s. *d.*	lbs.
19 6	9·8
33 6	8·7
45 0	9·75
61 6	11·1

It is noticeable that the families who furnished these particulars—17 in number—at the lowest wage point of 19*s.* 6*d*., were found to consume more tobacco per family than the 126 who formed the group with the average income of 33*s.* 6*d.* It should be remembered once more that the first group consisted mainly of farm labourers' families.

The difficulty of forming any estimate is increased by the fact that the amount of tobacco consumed, as also of alcohol, is a matter more of individual idiosyncracy than of economic condition. There are non-smokers and there are heavy smokers in every class.

Further, to quote a note which Mr. Reade has been good enough to send me:—

"The actual rate of duty borne by any kind of smokable tobacco depends on the quantity obtained from a given amount of raw leaf, on which the duty is originally assessed. Thus, from 100 lbs. of raw leaf there may be obtained 90 lbs. of cigars, which contain less moisture than the leaf from which they are made; or 110 lbs. of common shag, which contains much more moisture than the leaf. Hence the tax on 1 lb. of manufactured tobacco as sold retail may be more or less than that on the raw leaf.

"Perhaps the best tobacco to take for a general average is the working man's tobacco, not of the moistest kind. It may be assumed that the raw leaf, when charged with duty, contains only about 12 per cent. moisture, while the tobacco as sold contains about 24 per cent. moisture. In this case the duty on the raw leaf in 1903–04 being 3*s.* per lb., and in 1913–14 3*s.* 8*d.* per lb., the real duty charge on 1 oz. of the tobacco as sold retail would have been—in 1903–04, about 2*d.*; in 1913–14, about 2⅜*d.*"

An estimate made by the Board of Customs and Excise in respect of the year 1914–15 put the consumption of tobacco, speculatively, at 2 ozs. per week for families with incomes of 52*l.* to 65*l.* a year. 2½ ozs. for families with incomes of 78*l.* to 91*l.* a year, and 3 ozs. a week above that. We may accept these figures for working-class families for the year 1914, and reduce them by 10 per cent. for the year 1904, when the national consumption per head was less by that amount. It will be necessary to make some addition for middle-class and wealthy families, on account of the higher rate of duty on the kinds of tobacco they chiefly consume. The addition must needs be an arbitrary one, but the amount of error is of little importance, since it can only be an infinitesimal fraction of the total taxation paid by those classes.

On this basis our table for 1903–04 may be framed tentatively as follows:—

Income.	Tax paid per annum.		
£	£	*s.*	*d.*
50	0	15	7
100	1	3	4
150	1	10	0
200 and above	2	0	0

This estimate approximates fairly closely to Sir Bernard Mallet's estimate in 1901:—

	Annual taxation on tobacco consumed. £ *s.* *d.*
Working-class family	1 5 2
Lower middle-class family	1 8 6
Income-tax paying class family	2 1

For the year 1913–14, with increased consumption and increased rate of taxation, the table would be:—

Income. £	Tax paid per annum. £ *s.* *d.*
50	1 0 7
100	1 10 10
150	2 0 0
200 and above	2 10 0

With respect to the year 1918–19, here again there are no data on the consumption of the various classes under the abnormal war conditions. The Sumner Committee did not include either alcoho or tobacco in the items of consumption which they investigated. The only information available is the fact that the revenue from tobacco was estimated for Budget purposes at about 41,000,000*l.*, but is now considered likely to reach 44,000,000*l.* There are no official figures of the number of the population remaining within the United Kingdom this year; but I am informed by the Registrar-General that it is certainly considerably lower than the 46,089,000 estimated for the middle of 1914, but probably larger than the 42,611,000 estimated for 1904. We may take the figures for 1903–04 and vary the amount of taxation paid in that year in the same proportion as the total present revenue from tobacco bears to the then revenue. We may include the 1,850,000*l.* now derived from matches, which are consumed mostly by smokers and therefore in much the same proportion as tobacco. The tobacco revenue in 1903–04 was 12·62 million pounds:—

Income. £	Tax paid per annum (tobacco and matches). £ *s.* *d.*
100	4 4 10
150	5 9 0
200 and above	7 5 5

Alcohol.

The consumption of alcoholic liquors lends itself to budgeting even less than does tobacco. It is a point on which people are sensitive. The investigators, careful and polite, are not disposed to probe too deeply. Where correct information is furnished it is usually supplied by exceptionally thrifty and intelligent heads of households, whose rate of consumption of liquor is not likely to be typical. Neither the investigation of the Board of Trade in 1904 nor that of the Sumner Committee in 1918 gives any information on the subject of alcohol. The Excise figures of 1908 included liquor consumption, but they were not regarded by the Department as reliable. The source from which they were collected was the publican himself, and it is not surprising that the rate of consumption which they indicated was much below that which was known from the national statistics to prevail among the population generally.

The only detailed investigation which gives us useful guidance is that made by Messrs. Joseph Rowntree and Arthur Sherwell in 1898, for the purposes of their book, *The Temperance Problem and Social Reform.* Basing themselves upon special inquiries in over 10,000 households, supplemented by much collateral evidence, they came to the conclusion that the average working-class family spent not less than 6*s.* a week on alcoholic liquor out of an average wage of 35*s.* This conclusion was examined by Sir Bernard Mallet, when he was dealing with these questions in 1902 and 1904, and accepted by him as the basis of his calculation. It has been recently considered by Mr. Reade, who sees no reason to question it.

From this starting point Sir Bernard Mallet made very careful supplementary inquiries, in which he was assisted by experienced officials of the Excise. The calculations, depending as they did on the character and the alcoholic strength of the different kinds of liquor consumed by the various classes and in different parts of the United Kingdom, were too elaborate even to be summarized here. They led to the conclusion that in the year 1904 the average working-class family contributed to the revenue, in respect of the taxation of alcoholic liquors, a sum of 3*l.* 1*s.* 2¾*d.*; a lower middle-class family a sum of 3*l.* 19*s.* 9¾*d.*; and a family of the income-tax paying class a sum of 14*l.* 3*s.* 3½*d.* Mr. Reade, reviewing these figures, writes that he regards them as "not improbable."

There are, so far as I am aware, no data which would enable an allocation to be made, on a basis of ascertained fact, among the larger number of sub-divisions of the population which have been taken for the purposes of the present inquiry. We are compelled to allot arbitrary figures, applying Sir Bernard Mallet's conclusions by the light of the common knowledge of the conditions that prevail.

With respect to the estimate for the class of income-tax payers, an answer given by the Chancellor of the Exchequer in the House of Commons on May 13, 1914, estimated the taxable income of the average income-tax payer at 770*l.* in 1903–04, and 786*l.* in 1913–14. As the consumption of alcoholic liquor certainly cannot rise in the case of the larger income-tax payers in proportion to their incomes—at least, it may be hoped that it does not, for the sake of the sobriety of millionaires—the point at which the average liquor duty contribution is paid is probably somewhat lower than the point of average income received.

I suggest the following table as representing the probabilities of the case so far as the available data allow us to gauge them:—

1903-04.

Income.	Tax paid on alcoholic liquors.	Income.	Tax paid on alcoholic liquors.
£	£ s.	£	£ s.
50	2 10	500	11 0
100	3 10	1,000	18 0
150	4 0	2,000	24 0
200	5 0	5,000 and above	30 0

By the year 1913–14 the population had increased by 8·2 per cent. The revenue from alcoholic liquors had increased by only 1·6 per cent., beer increasing from 13,480,000*l.* to 13,650,000*l.*, spirits from 23,320,000*l.* to 23,960,000*l.*, and wine decreasing from 1,330,000*l.* to 1,150,000*l.* There was an average diminution in the taxation paid per head of 6 per cent., or 1*s.* 2*d.* in the *l.* We may disregard the fractional adjustments as between classes that might be thought to be necessary on account of the decrease in the wine revenue, particularly since it is an error to suppose that the wine duties affect solely or mainly the taxation paid by the wealthier classes. A very large proportion of wine—it has been estimated by the trade that it may be, perhaps, 70 per cent.—is consumed at wine bars and in public-houses and cheap restaurants, though this would not represent 70 per cent. of the taxation, owing to the higher duties on sparkling wine and better quality port.

The table for 1913–14 will be as follows:—

1913-14.

Income.	Tax paid on alcoholic liquors.	Income.	Tax paid on alcoholic liquors.
£	£ s.	£	£ s.
50	2 7	500	10 7
100	3 6	1,000	16 19
150	3 16	2,000	22 12
200	4 14	5,000 and above	28 5

In the present year the conditions of supply are wholly artificial, and there are no data of any kind as to the comparative consumption of alcoholic liquor by the various classes of the population. The present liquor duties are estimated to bring in 54,370,000*l.* in a full year. The increase of revenue compared with 1903–04 is 42·5 per cent. Allowing for some increase in the present population since that date, we may take the additional taxation per family for the purposes of these calculations, which must necessarily be rough, at 40 per cent. on the figures for 1903–04. This gives us the following table :—

1918–19.			
Income.	Tax paid on alcoholic liquors.	Income.	Tax paid on alcoholic liquors.
£	£ *s.*	£	£ *s.*
100	4 18	1,000	25 4
150	5 12	2,000	33 12
200	7 0	5,000 and above ..	42 0
500	15 8		

Other indirect taxes.

There remain to be allocated certain additional indirect taxes, the yield of all of which is small, with the exception of the Entertainments Duty, which was estimated to bring in 6,000,000*l.* this year. These taxes are the following :—

	Estimated Yield (million £).		
	1903-04.	1913–14.	1918–19.
Coffee, cocoa and chicory	·51	·56	1·50
Dried fruits	·44	·51	·30
Patent medicines	·32	·36	·80
Table waters	—	—	1·44
Entertainments	—	—	6·00
Cinema films (imported)	—	—	·15
	1·27	1·43	10·19

The 1904 Budgets showed the following weekly expenditures :

Income.	Coffee and cocoa.	Dried fruit.	Total.	Per family of five.
s. *d.*	*d.*	*d.*	*d.*	*d.*
21 4½	2	1½	3½	3½
36 6¼	4¼	3	7¼	6¾
52 0½	5½	3¾	9¼	7

This indicates that at that time the better-paid working people purchased about twice as much of these commodities as the poorer. The revenue under these heads was 3*s.* 2*d.* per family of 5 in 1903–04, and the same sum in 1913–14. We may make the following estimate for those years :—

Other indirect taxes, 1903–04 *and* 1913–14.

Income.	Tax.	Income.	Tax.
£	*s.*	£	*s.*
50	1	150....	3
100	2	200 and above ..	4

The Sumner Committee's Report gives the following information for 1918–19 :—

	Weekly expenditure per "standard family."		
	Coffee.	Cocoa.	Total.
	d.	*d.*	*d.*
Unskilled	2½	6½	9
Semi-skilled	2½	7½	10
Skilled	3	8	11
Clerks	3	6½	9½

This indicates a much smaller difference this year between the quantities consumed by the better paid and the less well paid among the working people.

There is no useful information with respect to the contributions to the Entertainment Duty, but it is known that the great bulk of the receipts come from the cheap seats, those at 1*s.* and under. Table-waters are consumed mainly by the income-tax paying classes. The small revenue involved may be allocated tentatively as follows, the national average per family of 5 being 1*l.* 5*s.* :—

1918–19.

Income.	Other indirect taxes.	Income.	Other indirect taxes.
£	£ *s.* *d.*	£	£ *s.* *d.*
100	1 0 0	500....	2 0 0
150	1 2 6	1000 and above	3 0 0
200	1 5 0		

Post Office.

There are four possible modes of dealing with the receipts of the Post Office in considering the allocation of taxation.

(1) We may regard the whole of the gross receipts as revenue drawn from the public, and the expenditure of the Post Office as part of the expenses of Government. This view, although it was supported by the authority of Sir Robert Giffen in his answers to certain questions addressed to economists by the Royal Commission on Local Taxation, is not generally accepted. The revenue of the Post Office is usually considered to be, in the main, direct payment for services rendered. It would be unreasonable, for example, to regard an annual payment for the use of a telephone by a subscriber who had been connected with the National Telephone Company's system as a payment for service, but to look upon the payment of an equal sum by his neighbour who subscribed to the Post Office telephone system as a tax contributed to the Exchequer. The cost of carrying a letter from one place to another cannot, I think, be placed on a different footing.

(2) The second alternative would be to regard none of the revenue of the Post Office as taxation, to look upon so much of the receipts as was necessary to cover the expenses as payment for services rendered, and the balance remaining as the profit of a business, which happens to be conducted by the State. The objection to this course lies in the fact that the Post Office charges are fixed by Parliament, not solely with regard to commercial considerations, but with reference also to the needs of the Exchequer. If, for example, Parliament levied a war tax of a halfpenny on every letter, which was collected by a special additional stamp to be affixed in each case, the charge would be as clearly a tax as the duty charged on entertainment tickets and collected by special stamps. The fact that the business was conducted in the one case by the State itself, and in the other by private enterprise, would not affect the issue. The economic effect must be the same if the war charge is imposed, not by special stamps, but by alterations in the rates of postage or of telegraphing.

(3) The third alternative, for which there is more to be said, is to regard an ordinary rate of commercial profit as non-tax revenue, and anything above that as taxation. But if the matter were to be treated on commercial lines the whole profit would be distributed, sooner or later, among the proprietors. The State, however, withholds it from the citizens to whom it belongs, and by keeping that profit is able to abstain from imposing taxation of equal amount in other ways. In other words, if the Post Office were run so as to

pay its expenses and nothing more, additional taxation would have to be imposed to make up the revenue which is required.

(4) We are therefore led to accept the fourth alternative, which is to treat the whole of the net revenue of the Post Office as taxation. This conclusion was reached by most of the authorities who were consulted by the Royal Commission to which reference has been made Sir E. Hamilton, Lord Courtney, Professors Bastable, Marshall and Sidgwick, and Mr. Sanger. It has subsequently been adopted also by Sir Bernard Mallet.

The data for allocating this burden among the various classes of the population are scanty. In his book *British Budgets* (published in 1913) Sir Bernard Mallet estimated that the income-tax paying classes contributed thirteen-eighteenths of this revenue, and the other classes five-eighteenths. Sir Charles King, the experienced Comptroller and Accountant-General of the Post Office, tells me that, although there are no figures in his department on which a reliable estimate can be based, he has come to the conclusion that the income-tax paying classes contribute "at least three-fourths" of the net revenue. The two estimates, therefore, correspond very closely, and we may accept the figure of thirteen-eighteenths for our present purpose. Sir Bernard Mallet estimated also that the income-tax paying classes number one-ninth of the population.

In 1903–04 the Post Office yielded to the Exchequer a surplus of 4·3 millions. On the basis we have accepted, income-tax paying families would contribute on the average 3*l.* 5*s.* 10*d.* per annum, and other families 3*s.* 2½*d.*

In 1913–14 the net revenue was 6·2 millions. Allowing for the increase of population, the corresponding figures would be: income-tax paying families 4*l.* 8*s.* 4*d.*, others 4*s.* 1*d.*

In 1918–19 the net revenue is estimated to be over 6*l.* millions, perhaps considerably over. The population remaining in the United Kingdom is less than in 1913–14, but the percentage of decrease in the population is not likely to counterbalance the probable percentage of increase in the Post Office revenue. It would be in accordance with the present probabilities of the case if we repeat for 1918–19 our estimates for 1913–14.

For allocating this head of taxation among the subdivisions of the population there are here, again, no trustworthy data. Our variations from the two main figures must necessarily be arbitrary. It should be remembered that almost all the Post Office profit is derived from the letter post, and that this in turn consists in an overwhelming proportion of business communications. A small tradesman with 300*l.* a year is likely to contribute to this head of revenue a much larger sum than a clerk with an equal income. It may be contended also that the cost of postage, in the case of businesses, is a trade expense which is distributed, in the long run, over the community. It is hardly necessary, however, to pursue the question of incidence to this further stage, for the sums involved are comparatively so small that our main conclusions cannot be appreciably affected.

I suggest the following estimate in respect of the Post Office revenue :—

	1903-04.	1913-14 and 1918-19.		1903-04.	1913-14 and 1918-19.
£	£ *s.* *d.*	£ *s.* *d.*	£	£ *s.* *d.*	£ *s.* *d.*
50	0 1 0	0 1 4	500	1 0 0	1 6 0
100	0 2 0	0 2 8	1,000	4 0 0	5 6 0
150	0 4 0	0 5 4	2,000 and upwards	8 0 0	10 10 0
200	0 6 0	0 8 0			

Summary.

We are now in a position to frame a combined table of all the taxes :—

Taxation paid pe

ome.	Direct Taxation.						Indirect			
	Income and Super-Tax.		Death Duties.	Inhabited House Duty.	Total Direct Taxes.		Tea.	Sugar.	Tobacco.	Alcohol.
					Earned Income.	Unearned Income.				
03-4										
£	£ s. d.		£ s.	£ s. d.	£ s. d.	£ s. d	£ s. d	£ s. d	£ s. d.	£
50	—		—	—	—	—	0 13 0	0 11 2	0 15 7	2 1
100	—		—	—	—	—	0 14 3	0 13 3	1 3 4	3 1
150	—		—	0 4 6	0 4 6	0 4 6	0 15 0	0 13 9	1 10 0	4
200	1 16 8		4 7	0 7 6	2 4 2	6 11 2	0 17 6	0 14 1	2 0 0	5
500	16 0 10		10 18	1 5 0	17 5 10	28 3 10	0 17 6	0 14 1	2 0 0	11
1,000	45 16 8		29 2	3 0 0	48 16 8	77 18 8	0 17 6	0 14 1	2 0 0	18
2,000	91 13 4		65 10	4 15 0	96 8 4	161 18 4	0 17 6	0 14 1	2 0 0	21
5,000	229 3 4		200 4	9 0 0	238 3 4	438 7 4	0 17 6	0 14 1	2 0 0	30
,000	458 6 8		436 16	15 0 0	473 6 8	910 2 8	0 17 6	0 14 1	2 0 0	30
,000	916 13 4		1.019 4	28 0 0	944 13 4	1,963 17 4	0 17 6	0 14 1	2 0 0	30
,000	2,291 13 4		2,730 0	55 0 0	2,346 13 4	5,076 13 4	0 17 6	0 14 1	2 0 0	30
13-14										
50	—		—	—	—	—	0 12 0	0 5 5	1 0 7	2
100	—		—	—	—	—	0 13 2	0 6 5	1 10 10	3
150	—		—	0 4 6	0 4 6	0 4 6	0 13 10	0 6 8	2 0 0	3 1
	*	†								
200	0 7 6	0 11 8	4 4	0 7 6	0 15 0	5 3 2	0 16 2	0 6 10	2 10 0	14 1
500	12 0 0	18 13 4	14 0	1 5 0	13 5 0	33 18 4	0 16 2	0 6 10	2 10 0	10
1,000	37 10 0	58 6 8	35 0	3 0 0	40 10 0	96 6 8	0 16 2	0 6 10	2 10 0	16 1
2,000	75 0 0	116 13 4	84 0	4 15 0	79 15 0	205 8 4	0 16 2	0 6 10	2 10 0	22 1
5,000	291 13 4		280 0	9 0 0	300 13 4	580 13 4	0 16 2	0 6 10	2 10 0	28
,000	758 6 8		700 0	15 0 0	773 6 8	1,473 6 8	0 16 2	0 6 10	2 10 0	28
,000	1,591 13 4		1,540 0	28 0 0	1,619 13 4	3,159 13 4	0 16 2	0 6 10	2 10 0	28
,000	4,091 13 4		4,900 0	55 0 0	4,146 13 4	9,046 13 4	0 16 2	0 6 10	2 10 0	28
18-19										
100	—		—	—	—	—	1 0 0	2 10 5	4 4 10	4 1
150	—		—	0 4 6	0 4 6	0 4 6	1 2 0	2 17 3	5 9 0	5 1
200	—		4 4	0 7 6	0 7 6	4 11 6	1 7 7	3 0 9	7 5 5	7
	*	†								
500	33 15 0	45 0 0	14 0	1 5 0	35 0 0	60 5 0	1 12 6	3 1 10	7 5 5	15
1,000	146 5 0	182 16 3	35 0	3 0 0	149 5 0	220 16 3	1 12 6	3 1 10	7 5 5	25
2,000	450 0 0	525 0 0	84 0	4 15 0	454 15 0	613 15 0	1 12 6	3 1 10	7 5 5	33 1
5,000	1,787 0 0		315 0	9 0 0	1,796 10 0	2,111 10 0	1 12 6	3 1 10	7 5 5	42
,000	4,187 0 0		770 0	15 0 0	4,202 10 0	4,972 10 0	1 12 6	3 1 10	7 5 5	42
,000	9,437 0 0		2,100 0	28 0 0	9,465 10 0	11,565 10 0	1 12 6	3 1 10	7 5 5	42
,000	25,187 10 0		6,650 0	55 0 0	25,242 10 0	31,892 10 0	1 12 6	3 1 10	7 5 5	42

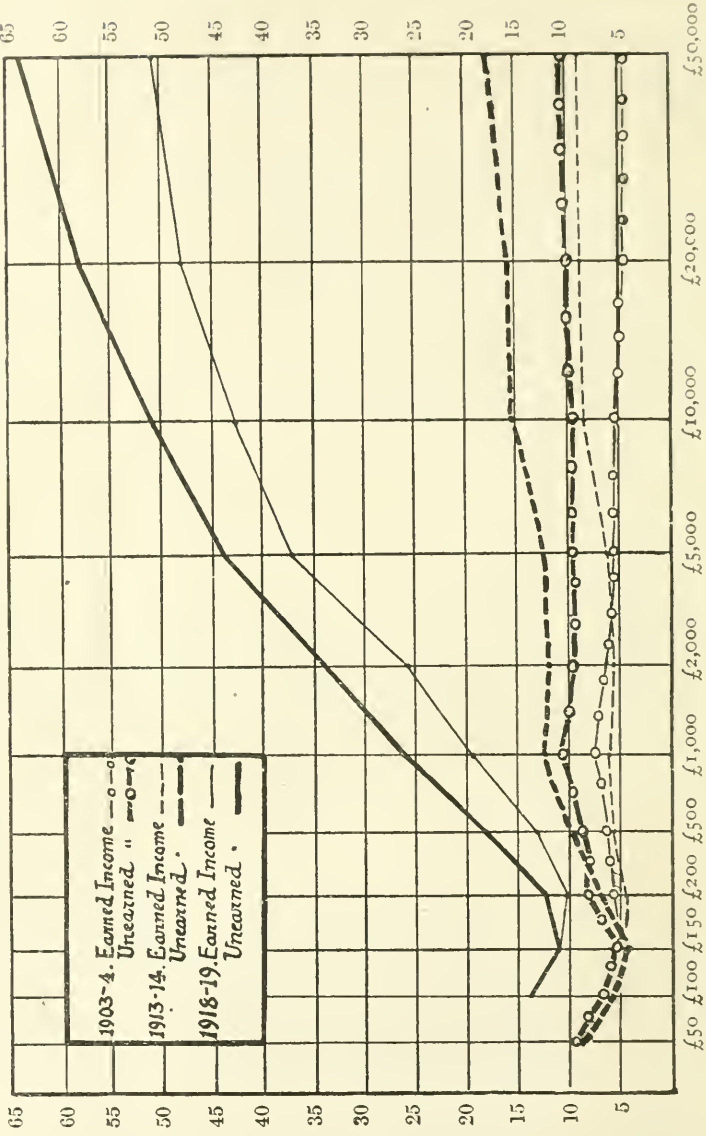
Earned income. † Unearned income. The charge in respect to death duti *mily of five persons.*

xation.								Total Taxation.						Direct taxes: Percentage of income.		Indirect taxes: Percentage of income.	Total taxation: Percentage of income.		Incom
)ther .direct 'axes.		Post Office.			Total Indirect Taxes.			Earned Income.			Unearned Income.			Earned per ct.	Un-earned per ct.		Earned per ct.	Un-earned per ct.	1903
s.	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*	£	*s.*	*d.*			per cent.			£
1	0	0	1	0	4	11	9	4	11	9	4	11	9	—	—	9·1	9·1	9·1	
2	0	0	2	0	6	4	10	6	4	10	6	4	10	—	—	6·2	6·2	6·2	
3	0	0	4	0	7	5	9	7	10	3	7	10	3	0·1	0·1	4·8	5·0	5·0	
4	0	0	6	0	9	1	7	11	5	9	15	12	9	1·2	3·2	4·5	5·6	7·8	
4	0	1	0	0	15	15	7	33	1	5	43	19	5	3·4	5·6	3·1	6·6	8·8	
4	0	4	0	0	25	15	7	74	12	3	103	14	3	4·8	7·8	2·5	7·4	10·3	1,
4	0	8	0	0	35	15	7	132	3	11	197	13	11	4·8	8·0	1·7	6·6	9·8	2,
4	0	8	0	0	41	15	7	279	18	11	480	2	11	4·7	8·7	0·8	5·6	9·6	5,
4	0	8	0	0	41	15	7	515	2	3	951	18	3	4·7	9·1	0·4	5·1	9·5	10,
4	0	8	0	0	41	15	7	986	8	11	2,005	12	11	4·7	9·8	0·2	4·9	10·0	20.
4	0	8	0	0	41	15	7	2,388	8	11	5,118	8	11	4·7	10·2	0·08	4·8	10·2	50,
																			1913-
1	0	0	1	4	4	7	4	4	7	4	4	7	4	—	—	8·7	8·7	8·7	
2	0	0	2	8	6	1	1	6	1	1	6	1	1	—	—	6·0	6·0	6·0	
3	0	0	5	4	7	4	10	7	9	4	7	9	4	0·1	0·1	4·8	4·9	4·9	
4	0	0	8	0	8	19	0	9	14	0	14	2	2	0·3	2·5	4·4	4·8	7·0	
4	0	1	6	0	15	10	0	28	15	0	49	8	4	2·7	6·8	3·1	5·8	9·9	
4	0	5	6	0	26	2	0	66	12	0	122	8	8	4·0	9·6	2·6	6·6	12·2	1,
4	0	10	10	0	36	19	0	116	14	0	242	7	4	4·0	10·2	1·8	5·8	12·0	2,
4	0	10	10	0	42	12	0	343	5	4	623	5	4	6·0	11·6	0·8	6·8	12·4	5,
4	0	10	10	0	42	12	0	815	18	8	1,515	18	8	7·7	14·7	0·4	8·1	15·1	10,
4	0	10	10	0	42	12	0	1,662	5	4	3,202	5	4	8·0	15·7	0·2	8·3	16·0	20,
4	0	10	10	0	42	12	0	4,189	5	4	9,089	5	4	8·3	18·0	0·08	8·4	18·1	50,
																			1918
0	0	0	2	8	13	15	11	13	15	11	13	15	11	—	—	13·8	13·8	13·8	
2	6	0	5	4	16	8	1	16	12	7	16	12	7	0·1	0·1	10·9	11·0	11·0	
5	0	0	8	0	20	6	9	20	14	3	24	18	3	0·2	2·2	10·1	10·3	12·4	
0	0	1	6	0	30	13	9	65	13	9	90	18	9	7·0	12·0	6·1	13·1	18·1	
0	0	5	6	0	45	9	9	194	14	9	266	6	0	14·9	22·0	4·5	19·4	26·5	1,
0	0	10	10	0	59	1	9	513	16	9	672	16	9	22·7	30·7	2·9	25·6	33·6	2,
0	0	10	10	0	67	9	9	1,863	19	9	2,178	19	9	35·9	42·2	1·3	37·2	43·5	5.
0	0	10	10	0	67	9	9	4,269	19	9	5,039	19	9	42·0	49·7	0·6	42·6	50·3	10.
0	0	10	10	0	67	9	9	9,532	19	9	11,632	19	9	47·3	57·8	0·3	47·6	58·1	20,
0	0	10	10	0	67	9	9	25,309	19	9	31,959	19	9	50·4	63·7	0·1	50·6	63·9	50,

ibuted to Unearned Income in all cases.

PERCENTAGE OF INCOME CONTRIBUTED IN TAXATION.

(*The lateral divisions do not represent the true proportion between the incomes.*)



Percentage of total taxation to income.

Income.	Earned income.			Unearned income.		
	1903–04.	1913–14.	1918–19.	1903–04.	1913–14.	1918–19.
£						
50	9·1	8·7	—	9·1	8·7	—
100 ..	6·2	6·0	13·8	6·2	6·0	13·8
150	5·0	4·9	11·0	5·0	4·9	11·0
200	5·6	4·8	10·3	7·8	7·0	12·4
500 ...	6·6	5·8	13·1	8·8	9·9	18·1
1,000	7·4	6·6	19·4	10·3	12·2	26·5
2,000 ...	6·6	5·8	25·6	9·8	12·0	33·6
5,000 .	5·6	6·8	37·2	9·6	12·4	43·5
10,000 ...	5·1	8·1	42·6	9·5	15·1	50·3
20,000	4·9	8·3	47·6	10·0	16·0	58·1
50,000	4·8	8·4	50·6	10·2	18·1	63·9

Conclusions.

I would venture to remind those who may make use of these tables and the diagram of certain points already mentioned in the course of this Address. The first is that these figures, although they are presented with their shillings and pence and their decimal points, make no pretence to the detailed accuracy which their appearance might imply. With the exception of the payments in Income-tax and Super-tax, they are all based upon estimates ; for many of those estimates the available material is sufficient, for others it is less adequate. The final results make no higher claim than to represent broadly the facts of the case. The second point is that all these figures relate to families of five persons. The average working-class family is somewhat larger, and the average taxation paid by them is, therefore, a little heavier. Where there is no family, and the income-tax allowances for wife and children cannot be claimed, the taxation payable by the smaller incomes above 130*l*. is also somewhat heavier. The third point of importance is that the charge in respect of Death Duties is allocated to Unearned Incomes only. It accounts for the whole difference between the taxation attributed to Earned and to Unearned Incomes for the year 1903–04, and for the greater part of the differences in the later years. It will be borne in mind also that, for reasons already stated, the Excess Profits Duty is excluded from the computation. That the amount of indirect taxation paid will vary, not only with family circumstances, but also with the personal habits of the individual, is obvious The working man who does not smoke or consume alcoholic liquors pays, of course, a far smaller percentage of his income in taxation than his less abstemious neighbour. He pays, in fact, in respect of a family of five, only one-third as much. A working-man, if he is above the income-tax level of 130*l* a year and has no allowances in respect of wife and children, would contribute one-half the taxation, if he were a non-smoker and a total abstainer, that he would contribute if he were not. Further, the same income may represent different conditions and contribute differently to taxation according to the occupation of the recipient. 200*l*. a year in the tables may stand for an artisan's family, or a clerk's, or a small shopkeeper's. The proportion spent on rent may be considerably greater in one case than in another, and the proportion spent on taxed commodities, and, therefore, the amount contributed to the revenue, may be less. It is possible here to take only the general average.

The columns of percentages in the tables show that the British system of taxation is regressive in the lower stages; the classes with the smallest incomes pay a larger proportion of them in contributions to the revenue than the classes immediately above them This inequality was very marked in the first period we have had under consideration. It had been redressed a little, but only a little, during the decade before the war. It still persists; though the disappearance of any considerable class in the community, with family incomes of only 1*l*. a week, has gone far to lessen the disparity. Such regression is the consequence of relying for revenue to so large an extent as we do upon the taxation of alcohol, tobacco, tea and sugar, and of the fact that the consumption of these articles is larger in proportion to income among the poorer classes.

Between 1903–04 and 1913–14, the percentage of income paid in taxation by the working classes had been reduced slightly, mainly owing to the decrease in the sugar-duty; it had been reduced slightly also as respects earned incomes up to 2,000*l*. a year. The rate of taxation on the higher incomes had been considerably increased during those ten years through the raising of the Income-tax and Death-duties and the introduction of the Super-tax. Both in 1903–04 and 1913–14 the burden of the death duties on the largest incomes was roughly equal to that of all the other taxes combined.

The war has rather more than doubled the percentages of income paid in taxation by the working classes and lower middle class. It has multiplied threefold the taxation on earned incomes of 1,000*l*. a year; and the increase continues, generally on a rising scale, up to the largest incomes. Earned incomes of 2,000*l*. to 5,000*l*. a year have suffered the most heavily in proportion, compared with the position before the war. Above 5,000*l*. there are probably few incomes that are not mainly derived from property, and the column for Unearned Incomes, including the charge for Death Duties, is the one which is significant.

At the present rates of taxation and in existing conditions, the workman with a family of five and an income of 2*l.* a week, with the average consumption of his class of alcohol, tobacco and other taxed articles, pays about 5*s.* a week in taxes; the workman with 3*l.* a week pays 6*s.* 6*d.*; and the man with 4*l.*, pays 8*s.* The lower middle-class income of 500*l.* contributes one-eighth, if it is earned, and one-sixth if it is unearned, the latter case including a charge in respect of Death Duties. The millionaire pays half his income in Income-tax and Super-tax, and two-thirds if provision for Death Duties is included.

The consumption of taxed articles this year is limited by the war-time restrictions of supply. If the present rates of duty are continued, while supplies are restored to their pre-war level, the revenue from indirect taxes will be largely increased. Estimates prepared by the Board of Customs and Excise indicate that the increase would be in the neighbourhood of one-fourth, but this would be accounted for to some extent by the increase in the numbers of the consuming population through the return of the soldiers and sailors. To whatever extent the restoration of normal importations and facilities of sale resulted in increased consumption of dutiable articles, to that extent the percentage of taxation paid by the working classes would rise in relation to the taxation paid by the rest of the community. The first table shows clearly how largely the burden of indirect taxation falls upon the smaller incomes, and how insignificant it is in relation to the larger.

The question at once presents itself, how far does our existing system of taxation conform to the requirements of justice? But that is a matter of politics and not of statistics. It is a subject for discussion in Parliament and on the platform, rather than for consideration here. That it will be there debated, as it has often been debated before, there is little doubt. We have progressed, or ought to have progressed, far beyond the simple rule of Colbert, that "the art of taxation consists in so plucking the goose as to "procure the greatest quantity of feathers with the least possible "amount of hissing." Statesmen and citizens, now that the situation can be reviewed free from the urgent preoccupations of war, will seek for a standard of justice, and by it they will test our present fiscal methods. The statistician can do no more than supply them with the raw material for their investigation. Much hangs upon the outcome; for on the fairness of their systems of taxation the progress, the contentedness and the stability of States in large degree depend.

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PROCEEDINGS ON JANUARY 21, 1919.

SIR ALFRED BATEMAN, in proposing a vote of thanks, said he owed it to his seniority amongst the officers of the Society that he had the privilege of proposing on their behalf a cordial vote of thanks to their President for his admirable address. As they probably knew, it had been their custom from the commencement of the Society to alternate in their elections. As a rule, they elected what they might call statisticians "*de carrière*," but very often it had been their habit, and he thought a very good habit, to elect not so much from themselves as from eminent public men, statesmen and politicians, and they had so made their choice this year.

Those who had heard the address would say that they might have elected their President on the narrower grounds of statistical science and knowledge, for he had given them a very excellent address on a most important subject in the incidence of taxation. They had always liked to make the change from a statistician to a public man for the reason that it might widen their views as statisticians, and it also used to be thought in the good old Victorian days that it might be "an influence for good" on politicians, in that they might get to think that after all statistics were meant to elucidate truth and not only to confound the adversary. Another custom of the Society was that the President's address was not discussed and criticised as every other Paper in the year was. It was taken rather as a sermon from a pulpit, which no one might criticise on pain of being had up for "brawling." He appreciated the truth of this many years ago when, in seconding the vote of thanks for the address, he was so rash as to criticise what appeared to him to be a serious statistical blunder by a President, if they could imagine such a thing. The President of the day was naturally very much annoyed and quoted to him the rule which dealt with it, and he had never forgotten since then. He understood that the President would rather have liked to have given some time to discussion and criticism, but they must remember that, as he had told them in his address, he had been in communication with a number of the best authorities on the different subjects he had discussed, so that expert criticism had not been wanted on the whole of the Paper. There was also the consideration that there were so many subjects in the Paper that they would certainly want more than one or two evenings to deal with it. There were such diverse subjects as alcohol, income tax, death duties, and many other points, on each of which they could spend a pleasant and profitable evening. But he thought for the reasons he had given them, they would be content to have received from their President such an exhaustive and admirable address which was likely to be the foundation for a great deal of useful discussion, and it was certainly ground for satisfaction that it did not fall short of those he remembered for the last fifty years in the Royal Statistical Society.

Sir BERNARD MALLET said he rose with particular satisfaction to second the vote of thanks to their distinguished President for his very able Address, because, as the President had indicated in his generous acknowledgement of the assistance which his (Sir Bernard's) investigations in the past had given him, the subject was one to which he had always attached great importance. At the same time, he was very glad that the rule to which Sir Alfred Bateman had alluded precluded him from having to make a critical examination of the figures, if only for the reason that he had had the Paper in his hands for too short a time to make such a task possible. He felt sure they would all agree, however, that even the shortest space of time was sufficient to enable them to pronounce this Address to be one of extreme interest and value, especially at the present moment when the community had to face the problem of meeting an appalling burden of public expenditure. He thought they would also agree that, making every allowance for the difficulties the President had mentioned, he had demonstrated the possibility of reaching results by such calculations as he had given them, which ought to be of great use to those who had to provide the revenue in the future and to decide how the burden of taxation should be distributed. He welcomed the fact that the attempt had this time been made by a statesman of acknowledged practical capacity, and it could not, therefore, be dismissed in official quarters with the indifference which had greeted certain earlier efforts in the same line. One of the professed reasons for that indifference was always the inadequacy of the data, but he had always felt that that objection came with bad grace from those who had it in their power, if they wished to do so, to improve the data. The President had told them he had felt the lack of exact information on some points, including some of the indirect taxes. He might, perhaps, suggest another defect in their statistics, namely, the absence of accurate information about the taxable income of different classes, and the changes which occurred in such income, without which it was surely difficult to arrive at an opinion about the justice of incidence. They were very much in the dark about wages; but even less excusable, considering the mass of material which must be in the hands of the Inland Revenue Authorities, was the paucity of public knowledge about the incomes (and capital) of the various classes of income tax payers. The Annual Report of the Inland Revenue Department, which might throw a flood of light on social conditions in these classes, had so dwindled of late years in size and interest, that it was hardly worth consulting on such points as these. He hoped that one result of the President's Address would be to stimulate improvement in those matters. It was, however, surprising, as anyone who had made the attempt knew, to see how much could be done even with indifferent material to arrive at what appeared to be satisfactory results. It seemed to him that their President had proved, by his very skilful examination of various sources of information at his disposal, that he possessed in a very high degree the instincts of a statistician. None of them would wish to commit themselves to every detail of his calculations at such short notice, but he thought the President had probably got as close to the truth as any single investigator could do with the available material. He doubted whether they would get much further until they had a small standing body of experts, possibly attached to the Treasury, to deal with all those questions of taxation at home and abroad, and to investigate not only particular questions referred to them, but also questions of the distribution of national income and the way in which taxation fell upon it. Such a body might even, in course of time, evolve some definite principles which should govern the proportion in which different classes should contribute towards the revenue. Research and intelligence were now so much the fashion that perhaps one might assume that this branch of the subject was not being neglected. He wished to add his sincere thanks for the much too kind way in which the President had spoken of his predecessor's work for the Society; and would conclude by expressing the hope that before very long Mr. Samuel would find himself back in his place in Parliament and able to take a share in the discussion of the questions to which he had that evening made so important a contribution, and with which he was one of the very few Ministers or ex-Ministers qualified to deal.

The vote was put to the meeting and carried unanimously.

The PRESIDENT, in reply, said he wished to thank them very cordially for the vote they had been kind enough to pass. He greatly appreciated the remarks which had been made as to his Paper by the two former Presidents who had been good enough to propose and second the resolution. He had found the task of preparing the Paper a very absorbing one for some weeks. The subject was one which had always been to him one of particular interest, and he regretted on many grounds that the traditions of the Society, which were in the nature of laws of the Medes and Persians, did not permit of a discussion, although he quite realised the kindness of the motive which inspired their forebears to make that rule. It was naturally understood that a Presidential Address would probably, or possibly, not bear expert examination and criticism. As to the future, he shared the hope of Sir Bernard Mallet that steps would be taken by the Government to establish something in the nature of an Intelligence Department at the Treasury, which would work out many of these problems for the information of Parliament and the public, and for the guidance of Ministers. He hoped that might be done, and, if so, the Address he had given them would probably appear, in the light of the fuller information that might then be available, somewhat primitive. At the same time, he would feel proud if it proved that he had been a pioneer in a field of discussion in which undoubtedly further investigation would be of the greatest utility to the country.

The following Candidates were elected Fellows of the Society:—

Alfred Ernest Cadman, B.A.
Guido Pardo, LL.D.
Hubert Linzee Tutill.
Benjamin White.

PROBLEMS OF INDUSTRIAL ORGANISATION.

By MAJOR GREENWOOD, Capt. R.A.M.C., T.F.
(Lister Institute and Ministry of Munitions).

[Read before the Royal Statistical Society, February 18, 1919,
The Ex President, Sir BERNARD MALLET, K.C.B., in the Chair.]

I.—INTRODUCTION.

THE object of this Paper is to collect some of the results obtained and illustrate certain of the methods adopted by a group of students whose "work of national importance" has been done either in factories producing munitions of war, or in the offices of the department which has controlled the industry.

A justification of communicating these results to the Royal Statistical Society is afforded by the words of Lord Kelvin which so appropriately grace a page of Professor Pearson's tables for biometricians—"When you can measure what you are speaking "about and express it in numbers, you know something about it, "but when you cannot measure it, when you cannot express it in "numbers, your knowledge is of a meagre and unsatisfactory "kind."

All who have taken part in these researches have tried to act in the spirit of Lord Kelvin's aphorism.

Stated in general terms, the task of those with whom I have been associated was to provide materials for answering the question —what are the conditions, excluding those determining the efficiency of inanimate machines, which help or hinder industrial output? In other words—what are the factors of human efficiency?

In executing our commission, we imposed upon ourselves the duty of only submitting material reduced to quantitative form.

The researches were commenced under the auspices of the Health of Munition Workers Committee, appointed in 1915 by Mr. Lloyd George, and continued since Easter, 1917, in the Welfare and Health Section of the Ministry of Munitions, receiving financial and other support from the Medical Research Committee and the Lister Institute of Preventive Medicine. The industries which have yielded data have been mainly those concerned in the production of munitions of war; but, owing to the extensive scope of the munitions industries in modern warfare, the field is wider than its name would have suggested five years ago. In describing part of our work, I shall not preserve chronological order, but adopt what seems to be a logical sequence.

II. (*a*).—INDUSTRIAL WASTAGE: *General Considerations.*

If we wish to appraise the value of modifications of the routine of industrial life, we should have in our hands some method of standardisation and comparison, just as measures of sanitary reform are conventionally judged by a reference to standardised vital statistics. To appraise the consequences of recruiting labour from different social classes, age groups, occupational or geographical groups, we must have some common measure. Such a common measure is provided by the vital statistics of the industry if we use the term vital statistics in a specialised way as merely denoting the relations between entrance to and exit from an industry, so that our industrial "death" rate would then merely be the rate at which entrants to a trade pass out of it, or, differencing ourselves within a yet narrower circle, the rates of departure from particular factories. In this sense, "death" or wastage rates for different factories will be *prima facie* measures of the efficiencies of the respective factories, just as local death rates are of sanitary efficiency; and, again like real death rates, they will need special scrutiny and standardisation to allow us to isolate the several influences, such as age at entrance, nature of task, hours of labour, remuneration, &c., which are all contributory causes of the "death" rate.

The compilation of such industrial statistics had never been attempted in England before the war. The general movement to and from industries had, of course, been treated statistically, while intensive investigations of the kind envisaged have been carried out in particular factories, but, excepting Mr. Willits' monograph,[1] which, however, only dealt with one factory, I do not recall any inquiry comparable in extent with ours. Lest this may seem to put our claim too high, I hasten to add that we have dealt almost entirely with the statistics of female munition workers and by the method of sampling, not by the exhaustive enumeration which characterises the best class of vital statistics, while some factors enumerated above have not been evaluated.

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[1] "Steadying Employment." *Annals of American Academy of Political and Social Science*, May, 1916.

Our data cover 36,736 women employed in 18 munition factories and the general results are given in Table I. The method of compilation was by carding, and the percentages rates are not the rates of ordinary vital statistics, *i.e.*, they are not "death" rates, but analogous to the crude q_x columns of actuarial tables. I may remark in passing that a graduation of the rates has been attempted and effected successfully in some cases, but this detail is not of sufficient practical importance to detain us; the time has not arrived for the promulgation of an industrial wastage, or "mortality" table pretending to general authority. Having thus formed our crude rates of industrial wastage, we may consider the influence of special factors and, naturally, begin with that of age at entry. Tabulations by age at entry are shown in Tables II, III, IV and V.

TABLE I.—*All Factories. Combined Ages.*

Months of service.	Exposed.	Numbers left.				Percentages.			
		Ill-health.	Other sufficient reason.	No sufficient reason.	Total.	Ill-health.	Other sufficient reason.	No sufficient reason.	Total.
0	36,736	407	633	1,632	2,672	1·108	1·723	4·443	7·274
1	30,736	318	449	1,065	1,832	1·035	1·461	3·465	5·960
2	26,382	216	387	975	1,578	·819	1·467	3·696	5·982
3	22,254	176	308	803	1,287	·791	1·384	3·608	5·783
4	17,995	150	220	599	969	·834	1·223	3·329	5·385
5	14,469	126	200	451	777	·871	1·382	3·117	5·370
6	11,798	88	135	368	591	·746	1·144	3·119	5·009
7	9,710	43	104	261	408	·443	1·071	2·688	4·202
8	7,856	33	63	179	275	·429	·802	2·279	3·501
9	6,091	40	49	125	214	·657	·804	2·052	3·513
10	4,863	19	30	83	132	·581	·917	2·537	4·034
11	3,309	15	22	53	90	·453	·665	1·602	2·720
12	1,956	6	8	24	38	·307	·409	1·227	1·943
13	1,685	4	8	11	23	·237	·475	·653	1·365
14	1,475	—	6	11	17	—	·407	·746	1·153
15	1,325	3	6	11	20	·226	·453	·830	1·509
16	1,123	—	6	10	16	—	·534	·890	1·425
17	1,011	1	3	2	6	·099	·297	·198	·593
18	890	2	6	9	17	·224	·674	1·011	1·910
19	788	1	3	6	10	·127	·381	·761	1·269
20	668	1	1	3	5	·150	·150	·449	·749
21	531	—	4	5	9	—	·753	·941	1·695
22	402	1	1	8	10	·249	·249	1·990	2·488
23	344	—	2	3	5	—	·581	·871	1·453
24	292	1	3	—	4	·342	1·027	—	1·370
Totals	204,689	1,651	2,657	6,697	11,005	·807	1·298	3·266	5·376

TABLE II.—*All Factories. Ages* 13–17.

Months of service.	Exposed.	Numbers left.				Percentages.			
		Ill-health.	Other sufficient reason.	No sufficient reason.	Total.	Ill-health.	Other sufficient reason.	No sufficient reason.	Total.
0	2,937	17	26	155	198	·579	·885	5·277	6·742
1	2,515	8	23	91	122	·318	·915	3·618	4·851
2	2,237	6	23	76	105	·268	1·028	3·397	4·694
3	1,936	12	19	68	99	·620	·981	3·512	5·114
4	1,666	6	19	52	77	·360	1·140	3·121	4·622
5	1,466	8	10	38	56	·546	·682	2·592	3·820
6	1,251	4	5	31	40	·320	·400	2·478	3·198
7	1,090	2	7	14	23	·183	·642	1·284	2·110
8	989	1	2	13	16	·101	·202	1·314	1·618
9	900	5	5	19	29	·556	·556	2·111	3·223
10	800	1	2	5	8	·125	·250	·625	1·000
11	735	—	4	4	8	—	·544	·544	1·088
12	663	—	2	3	5	—	·302	·452	·754
13	614	1	3	7	11	·163	·489	1·140	1·792
14	537	—	1	9	10	—	·186	1·676	1·862
15	473	—	2	4	6	—	·423	·846	1·268
16	402	—	3	4	7	—	·746	·995	1·741
17	360	1	2	1	4	·278	·556	·278	1·112
18	304	1	—	2	3	·329	—	·657	·987
19	270	—	—	3	3	—	—	·741	·741
20	235	1	—	1	2	·426	—	·426	·851
21	195	—	2	4	6	—	1·026	2·051	3·077
22	145	1	—	—	1	·690	—	—	·690
23	118	—	1	1	2	—	·847	·847	1·794
24	95	1	—	—	1	1·053	—	—	1·053
Totals	22,933	76	161	605	842	·331	·702	2·638	3·672

TABLE III.—*All Factories. Ages* 18–22.

Months of service.	Exposed.	Numbers left.				Percentages.			
		Ill-health.	Other sufficient reason.	No sufficient reason.	Total.	Ill-health.	Other sufficient reason.	No sufficient reason.	Total.
0	14,395	135	165	542	842	·938	1·146	3· 65	5·849
1	12,388	128	147	388	663	1·033	1·187	3·132	5·352
2	10,690	72	120	365	557	·674	1·123	3·414	5·210
3	9,056	75	117	300	492	·828	1·292	3·313	5·433
4	7,291	58	78	234	370	·796	1·070	3·209	5·075
5	5,869	43	85	172	300	·733	1·448	2·931	5·112
6	4,775	31	62	151	244	·649	1·298	3·162	5·110
7	3,937	12	48	116	176	·305	1·219	2·946	4·470
8	3,204	14	31	75	120	·437	·968	2·341	3·745
9	2,449	16	16	42	74	·653	·653	1·715	3·022
10	1,959	10	15	41	66	·510	·766	2·093	3·369
11	1,289	7	12	18	37	·543	·931	1·396	2·870
12	722	2	5	10	17	·259	·648	1·295	2·202
13	617	3	2	4	9	·483	·324	·648	1·459
14	557	—	4	1	5	—	·718	·180	·898
15	512	1	2	7	10	·195	·391	1·367	1·953
16	440	—	3	4	7	—	·682	·909	1·591
17	401	—	—	1	1	—	—	·249	·249
18	372	—	4	6	10	—	·995	1·493	2·488
19	326	—	2	3	5	—	·613	·920	1·534
20	279	—	—	1	1	—	—	·358	·358
21	218	—	2	—	2	—	·917	—	·917
22	166	—	1	7	8	—	·602	4·217	4·819
23	144	—	1	1	2	—	·694	·694	1·389
24	123	—	3	—	3	—	2·439	—	2·439
Totals	82,179	607	925	2,489	4,021	·739	1·126	3·029	4·893

TABLE IV.—*All Factories. Ages 23–27.*

Months of service.	Exposed.	Numbers left.				Percentages.			
		Ill-health.	Other sufficient reason.	No sufficient reason.	Total.	Ill-health.	Other sufficient reason.	No sufficient reason.	Total.
0	7,564	87	170	342	599	1·150	2·247	4·521	7·919
1	6,317	70	114	225	409	1·108	1·805	3·562	6·475
2	5,336	45	109	215	369	·843	2·043	4·029	6·915
3	4,441	34	68	175	277	·766	1·531	3·941	6·238
4	3,577	30	57	136	223	·839	1·594	3·802	6·234
5	2,798	32	46	86	164	1·144	1·644	3·074	5·861
6	2,251	19	23	72	114	·844	1·022	3·199	5·064
7	1,836	14	26	57	97	·763	1·416	3·105	5·283
8	1,431	8	17	37	62	·559	1·188	2·586	4·333
9	1,050	10	12	23	45	·952	1·143	2·190	4·286
10	792	5	5	9	19	·631	·631	1·136	2·399
11	509	2	3	14	19	·393	·589	2·750	3·733
12	267	2	1	5	8	·749	·375	1·873	2·996
13	226	—	1	—	1	—	·442	—	·442
14	192	—	1	—	1	—	·521	—	·521
15	168	1	1	—	2	·595	·595	—	1·190
16	144	—	—	1	1	—	—	·694	·694
17	127	—	1	—	1	—	·787	—	·787
18	103	1	1	—	2	·971	·971	—	1·942
19	94	—	—	—	—	—	—	—	—
20	83	—	1	—	1	—	1·205	—	1·205
21	63	—	—	1	1	—	—	1·587	1·587
22	42	—	—	—	—	—	—	—	—
23	40	—	—	—	—	—	—	—	—
24	34	—	—	—	—	—	—	—	—
	39,485	360	657	1,398	2,415	·912	1·664	3·541	6·117

TABLE V.—*All Factories. Ages 28 and over.*

Months of service.	Exposed.	Numbers left.				Percentage.			
		Ill-health.	Other sufficient reason.	No sufficient reason.	Total	Ill-health	Other sufficient reason.	No sufficient reason.	Total.
0	11,840	168	272	593	1,033	1·419	2·297	5·008	8·725
1	9,516	112	165	361	638	1·177	1·734	3·794	6·704
2	8.119	93	135	319	547	1·145	1·663	3·929	6·737
3	6,821	55	104	260	419	·806	1·525	3·812	6·143
4	5,461	56	66	177	299	1·025	1·209	3·241	5·475
5	4,336	43	59	155	257	·992	1·361	3·575	5·927
6	3,521	34	45	114	193	·966	1·278	3·238	5·481
7	2,847	15	23	74	112	·527	·808	2·599	3·934
8	2,232	10	13	54	77	·448	·582	2·419	3·450
9	1,692	9	16	41	66	·532	·946	2·423	3·901
10	1,312	3	8	28	39	·229	·610	2·134	2·973
11	776	6	3	17	26	·773	·387	2·191	3·351
12	304	1	—	6	7	·329	—	1·974	2·303
13	228	—	2	—	2	—	·877	—	·877
14	189	—	—	1	1	—	—	·529	·529
15	172	1	1	2	4	·581	·581	1·163	2·326
16	137	—	—	1	1	—	—	·730	·730
17	123	—	—	—	—	—	—	—	—
18	111	—	1	1	2	—	·813	·813	1·626
19	98	1	1	—	2	1·020	1·020	—	2·041
20	71	—	—	1	1	—	—	1·408	1·408
21	55	—	—	—	—	—	—	—	—
22	49	—	—	1	1	—	—	2·041	2·041
23	42	—	—	—	—	—	—	—	—
24	40	—	—	—	—	—	—	—	—
	60,092	607	914	2,206	3,727	1·010	1·521	3·671	6·202

A comparison between the rates at different ages is, however, more instructive if a somewhat different basis is chosen, viz., the percentage still employed at the expiry of a given number of months from entry. Such a comparison is effected in Table VI, which contrasts the three months' survival (in the industrial sense) rates of women at different ages in the several factories. Those factories denominated L factories were employing women on light physical work (cartridge making, small shells, fuze turning), the H factories were engaged upon heavier projectiles. A general comparison is made in Table VII, which gives the nine months' survival rates of the heavy and light factories as wholes. It will be noticed that the proportion of survivors diminishes with age at entrance, and that a comparison between heavy and light factories is increasingly unfavourable to the former after the age of 22 years.

TABLE VI.—*Three Months' Survival Rates.*

Factory.	Ages 18–22.	Ages 23–27.	Ages 28– .
L 4	84·16 ± ·83	81·08 ± 1·21	83·95 ± 1·06
L 5	93·60 ± ·74	94·12 ± ·71	89·50 ± 1·10
H 4	88·32 ± ·92	84·62 ± 1·81	81·65 ± 1·89
H 1	82·30 ± 1·67	72·88 ± 1·92	71·24 ± 1·23
H 8	66·27 ± 2·04	66·34 ± 2·86	66·93 ± 2·74
H 9	90·73 ± 1·40	86·81 ± 2·01	83·84 ± 1·56
L 3	85·75 ± ·73	81·50 ± ·98	86·07 ± ·67
H 2	81·03 ± 2·03	74·71 ± 2·00	66·56 ± 1·57
H 3	77·16 ± 1·53	64·76 ± 1·66	72·32 ± 1·14
H 5	87·89 ± 2·29	—	88·67 ± 1·74
H 10	85·71 ± ·52	82·70 ± ·86	81·01 ± ·78
L 1	81·32 ± ·71	81·07 ± 1·08	83·02 ± ·97
H 6	87·91 ± ·61	78·80 ± ·95	78·50 ± ·71
L 2	77·45 ± 1·05	71·81 ± 1·16	80·92 ± ·80
H 7	82·65 ± ·59	77·55 ± ·70	75·65 ± ·92
L 8	74·70 ± 2·06	—	—
L 6	70·29 ± 2·77	64·70 ± 3·68	71·87 ± 2·26
L 7	95·34 ± ·78	90·92 ± 1·46	87·78 ± 1·38

TABLE VII.—*Nine Months' Survival Rates.*

Age Group.	L.	H.	Difference.
18–22	67·55 ± ·52	59·64 ± ·49	7·91 ± ·71
23–27	65·15 ± ·76	51·46 ± ·68	13·69 ± 1·02
28–	66·59 ± ·59	52·45 ± ·54	14·14 ± ·80

II (*b*).—INDUSTRIAL WASTAGE: *Influence of Environment.*

We now pass to the influence of milieu. Table VIII contrasts two factories engaged upon similar work, the former having and the latter not having a highly organised system of welfare supervision. The advantage in respect of retention of workers of the factory with a welfare system appears to be considerable, and this *primâ facie* conclusion may be, and I hope is, a just conclusion. But scientific candour forces us to notice that in industrial comparisons the differences between the groups compared is seldom restricted to that variable the influence of which we desire to study. In the present instance the factory with a good welfare system was situated in the open country and recruited its labour from non-industrial classes, that is, from girls who had not been previously employed in factories; the factory without a welfare system was in a great city and drew upon an urban industrial population. For the comparison to be demonstrative (assuming that the difference of survival rates is greater than its sampling

TABLE VIII.—*Observed Losses of L 7 compared with those expected from the experience of Factory L 1.*

Under 22			23–27.			Over 28			All ages.		
	L. 7.	L. 1.		L 7	L 1.		L 7	L 1.		L 7	L 1.
0	11	43·18	0	12	26·28	0	22	22·81	0	45	92·72
1	5	30·93	1	4	15·15	1	10	17·05	1	19	63·13
2	1	9·54	2	1	8·68	2	2	8·05	2	4	26·27
3	–	8·42	3	1	5·18	3	2	4·94	3	3	18·54
4	–	5·23	4	1	3·26	4	–	2·89	4	1	11·38
5	3	4·61	5	–	1·39	5	3	2·05	5	6	8·05
6	1	1·60	6	–	1·38	6	–	1·16	6	1	4·14
7	–	1·04	7	–	·96	7	–	·74	7	–	2·74
8	–	·04	8	–	·03	8	–	·04	8	–	·11
9	–	·02	9	–	·04	9	–	·03	9	–	·09
10	–	·02	10	–	·02	10	–	—	10	–	·04
11	–	·04	11	–	—	11	–	—	11	–	·04
12	–	·04	12	–	—	12	–	—	12	–	·04
Over 12	–	—	over 12	–	—	over 12	–	—	over 12	–	—
Total	21	104·71	Total	19	62·37	Total	39	59·76	Total	79	226·84

error, a matter we need not here discuss), we should have to show that previous employment does not affect the industrial "death" rate; the data available are not adequate to this. The elucidation of that point is a promising research for future statisticians of industry.

II (*c*).—INDUSTRIAL WASTAGE: *Influence of the Type of Work.*

Next as to the influence of type of work. It has been shown that, on the whole, the rate of loss is greater among women over 22 in the heavy factories, than at younger ages, but it can be objected that the comparison is incomplete because of possible differences in milieu being correlated with the age constitution of the population, and that we need to compare women of the same age in factories identical in character, except as regards the kind of work done. This happens to be possible in our data. Factories L 3 and H 6 are in the same part of the country and both possess welfare organisations of the highest type; the character of the work done alone differentiates the factories. It is seen from the entries of Table VI that the age groups in these factories bear one to another the relation shown in factories as a whole. The younger women in the heavy factory do not fall away faster than those of similar age in the light factory, the women over 22 do. It may be asked why any differentiation sets in at so early an age as 22 when the physique of the ordinary woman is certainly not past, but nearing its prime, when there can be no question of a real failure of vitality. The probable explanation is given by Table IX which shows the civil state of factory workers in a representative sample. The proportion of married women increases very rapidly with age, and, therefore, the responsibilities of home life likewise increase. It seems that the married women can bear the strain of factory life reasonably well so long as the intensity of physical work involved is not severe; severe manual work tips the balance over.

TABLE IX.—*Civil State. Factories H* 4, *H* 10, *L* 3.

——	Married.	Single.	Widows.	Total.	Percentage married.
Under 22	243	3,856	4	4,103	5·92
23–27	536	1,358	15	1,909	28·08
Over 28	1,497	1,358	104	2,959	50·59

II (*d*).—INDUSTRIAL WASTAGE: *Comparison of Pre-War with War Conditions.*

We may now ask how these industrial statistics of war time compare with those of an earlier period. Table X shows the rates of loss in a factory which has carried on the munitions industry for many years, pre-war and war-time rates being contrasted. The differences are not great, they do not justify any charge of special frivolity or love of change due to the excitement of war and the ease with which re-employment is secured owing to the abnormal demands for labour. It may be added that in this particular factory the type of employed women (as shown by the nature of

TABLE X.—*Numbers remaining at work out of* 1,000 *entrants in accordance with various rates of Loss.*

Numbers remaining after months.	L 2 Factory (War time).	L 1 Factory (War (time).	L 1 Factory (Peace (time).	L 1 Factory (Peace time, ages 18–22).	L 1 Factory (War time, ages 18–22).	L 1 Factory (War time, ages 13—17).	L 1 Factory (War time, ages 23–27).	L 1 Factory (War time, ages 28–).
0	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
1	904	917	921	928	902	929	921	911
2	839	868	855	848	853	881	860	877
3	779	826	795	800	813	841	811	830
4	735	791	749	754	778	799	777	807
5	703	757	703	710	749	764	729	781
6	671	730	658	668	727	739	696	742

the previous occupations of those employed) has not altered materially since 1914.[1]

The results described afford us, I think, a fairly distinct view of the industrial statistics of employed women, so far as entrance to and exit from factories under different conditions are concerned, and these rates will be of some use in the future as criteria of the effects of changed conditions. I hope, too, that the statistical method is capable of being improved into a useful implement of industrial research.

III.—THE FEEDING OF INDUSTRIAL WORKERS.

Before passing from generalities descriptive of industrial conditions as a whole, another wide question may be asked and answered.

We have seen how the industrially employed population, or rather the industrially employed women "die" in the artificial sense of ceasing to be employed, but can we paint an equally clear picture of how they live in the natural sense, of their housing conditions, their food supply, and so on?

I have no special information to communicate on the subject of housing, but as to the feeding of the munitions worker, can offer some remarks.

The amounts of food consumed in hostels catering for 19,000 munitions workers during specified weeks or months were recorded and the nutritive values determined. The results showed that in the early part of 1917 the munitions workers were receiving a diet which, although by no means justifying the charges of wasteful extravagance launched against their fellow countrymen by a few journalists, compared not unfavourably with that of the working classes in time of peace. A similar statistical record has been maintained since the incoming of rationing, and, although the nature of the diet has changed, the supply of energy has not been materially affected. The numerical details of this inquiry are contained in the report cited below,[2] and are not from the purely statistical side of sufficient interest to reproduce here. I think, however, a word of caution is needed with respect to a possible generalisation of the results. Although the statistical sample measured was certainly adequate to provide a trustworthy measure of the consumption in industrial hostels, we must not forget that only a minority of industrially employed persons, even in the munitions industries, are fed in hostels; we are not warranted in arguing from these figures that the whole industrial population was equally well fed. The family budgets that I have been able to collect are not numerous enough to be worth quoting, and there are special difficulties in interpreting such budgets, dependent partly upon possible inaccuracies of record, partly upon the need of using coefficients of reduction to "man" values.

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[1] The full details of this inquiry are contained in *A Report on the Causes of Wastage of Labour in Munitions Factories employing Women*, by M. Greenwood, published as Report No. 16 of the Medical Research Committee (Stationery Office, 1918).

[2] *An Inquiry into the Composition of Dietaries, with Special Reference to the Dietaries of Munition Workers*, by Viscount Dunluce and Capt. Greenwood; Report No. 13, Medical Research Committee, 1918.

The best available comparison is, I think, between the average of our munition workers' hostel diets, viz., 3,463 calories per "man" per diem and the figure deduced by Sir Henry Thompson after a careful analysis of data supplied him by the War Emergency Committee for working-class families in 1917[1]; Sir Henry Thompson, whose murder by the German Government has deprived the student of nutrition of an admirable guide, gave 3,160 calories, while, by the method of reduction he used, the Board of Trade data for 1903 provide 3,410 calories, very nearly the same as our munition workers were computed to receive in hostels in 1917.[2] The difference between 3,160 calories and 3,463 calories may possibly represent the advantage in point of nourishment enjoyed by those catered for in hostels and good works' canteens.[3]

How far this consumption should be deemed sufficient to supply the energetic needs of the workers is a question which cannot be answered by the aid of merely descriptive data. Recourse must be had to experimental methods which will, in turn, provide material for statistical treatment. Here, too, something has been achieved.

The precise applicability of the law of energy conservation to the production of work by human beings was demonstrated several years ago. It is clear that a workman doing heavy labour requires more food than one engaged in a sedentary task. But the quantitative relation between the work done and the food needed has never been determined under conditions which approximate at all closely to those of ordinary life in factories. The problem is indeed a very difficult one to solve, because the number of variables of which the heat produced is a function is large.

Taking the most important of these in order, we have (1) the size and sex of the worker; (2) his, or her, efficiency, in the engineer's sense; (3) the rate at which the work is performed; (4) the external conditions under which the work is performed.

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[1] "The Food Requirements of a Normal Working-Class Family," by Sir Henry Thompson.—*Science Progress*, July, 1918, p. 79.

[2] The reduction of the Board of Trade budgets contained in Greenwood and Dunluce's Report differs from that of Thompson, owing to a different choice of reduction factors; those used by Thompson are to be preferred. See M. Greenwood and C. M. Thompson, *British Medical Journal*, August 10, 1918.

[3] For a comparison of English and German War diets, see Greenwood and Thompson, *Journal of the Royal Statistical Society*, December, 1918.

Of these main variables, (1) has been pretty completely elucidated; we know that there is a fairly constant difference in rate of intensity of metabolism between persons of the same age and different sex and that for adults of the same sex, other things being equal, resting heat loss varies directly as body surface. We also know a good deal about the influence of external conditions, thanks largely to the work of Dr. Leonard Hill,[1] who has provided an accurate method of measuring variations in the cooling or warming power of the air. With respect to (3), the work of Benedict and Cathcart, Macdonald and others[2] has established the fact that the total cost of work increase with the speed of performance, that speeding-up of production involves a definite increase of energy needed; a kilogramme-metre of work costs more if performed in a second than if executed in a minute.

Variable (2) still eludes us, save in the very simplest cases. It has, therefore, been necessary to carry out special measurements in the factories themselves upon persons performing different kinds of industrial labour. The data are not yet suitable for publication, but I refer to the matter here, because of the direct importance in what might seem to be a purely physiological inquiry of statistical science. In consequence of the number of variables and the necessary limitation of the experiments to an absolutely small number of instances, the interpretation of the results and the measurement of their applicability as rules of general practice in deciding upon ration scales for industrial workers involve the use of those methods of thought which are so familiar to us here.

IV.—NIGHT WORK AND DAY WORK.

From these not uninteresting generalities, let us turn to the subject of working hours beginning with the broad contrast of day with night labour. Needless to say, in the ordinary life of a civilised community relatively few should be engaged on industrial labour by night; but there must always be some night workers, and, in time of war, when the engines fashioning munitions can never stand idle, there are many. So it has been a problem of first-rate importance to determine how night work should be arranged so as to produce the minimum amount of inconvenience to the workers. There are two alternatives. We might employ a section of the workers permanently, or for long periods, only in the night hours; or we might interchange spells of day and night work at short intervals, a week or a fortnight. Which is to be preferred? *A priori* it would seem better to adopt the former plan, which certainly permits the worker to form new habits and thus to avoid the irritation most of us experience when our routine of life is interrupted. Experience has, however, taught us that this facile conclusion is incorrect.

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[1] Hill, *Report on Ventilation*, &c., L.G.B. *Public Health and Medical Reports*, N.S., No. 100, 1914.

[2] Benedict and Cathcart, *Muscular Work*, Carnegie Institute, Washington, 1913. Macdonald, *Proc. Roy. Soc.*, B. LXXXVII, 96 (1914); LXXXIX, 394 (1917); Greenwood, *ibid.*, XC, 199 (1918).

The neatest exemplification of the disadvantage of continuous nightwork in comparison with the alternating, or discontinuous, system is afforded by some observations of Dr. H. M. Vernon.[1] His principal data refer to 72 cartridge workers, who, after working on the discontinuous system (one week on day and then one week on night shift), went on to continuous day work for a period of five weeks, thereafter reverting to the discontinuous system, and to 74, who *vice versa*, worked continuously in the night shift for the same period of five weeks, thereafter also reverting to the alternating system. For the purpose of statistical analysis, Dr. Vernon divided the whole period into four intervals—(1) a discontinuous period of six weeks followed by (2) a continuous period of four weeks to which succeeded (3) and (4) a discontinuous period of ten weeks divided into two portions of five weeks each. The hourly rate of output of the workers employed upon the continuous day shift was only 0·9 per cent. less than the average output during the preceding and succeeding intervals when alternate weeks were worked by day and by night. In the case of the continuous night workers, the hourly output was 4·4 per cent. less than the average of the same workers when on discontinuous night work before and after the period.

These data have the great merit of referring to the same group of workers observed under the different arrangements of shifts. We were able to collect much evidence that in factories where the continuous system was adopted the output of the night workers tended to fall considerably behind that of the day workers, while, with an alternating system, the inferiority of the night production was trivial. Thus, I found in studying 92 day workers and 31 continuous night workers in a cartridge-case manufactory, that during the winter months the percentage inferiority of the night workers amounted to 17 ± 4·1, and in the summer to 12 ± 3·0. In other respects than that of production, the night workers were inferior, wastage and lost time were both greater than among the day workers. On the other hand, in an investigation of the individual outputs of 339 women employed in another cartridge factory upon the alternating system, the mean percentage ratio of night production in terms of day production was 98·7 ± 0·3, a very slight, although significant, inferiority.

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[1] Interim Report of the Health of Munitions Workers Committee, 8511, Od. p. 33.

The same result emerged from a study of production by 68 female lathe workers, made by Mr. S. H. Burchell, and me. The percentage ratio of production by night to production by day actually exceeded 100, but not significantly so, the figure being 101·3 ± 0·6.

These conclusions also hold for men. Dr. Vernon found (23 men on permanent day and 17 on permanent night shift) that production by night was 9 or 10 per cent. less than in the day shift. While Mr. Burchell and I found on 138 men employed in alternating shifts that the nightly production was somewhat greater than that by day. (103·8 ± 0·4.)

These results, I think, suffice to prove that in such a world as ours, night work is best performed intermittently. It seems to be impossible completely to transpose the order of one's life, so that the advantage of regular habits is not really secured by the continuous night worker; the candle burns at both ends.

V.—HOURS OF LABOUR AND OUTPUT.

Having determined the just apportionment of labour between day and night, we pass to the question of the length of shift. How many hours of the week should be devoted to industrial work?

I am not concerned with this question in any but the narrowest sense it will bear, viz., that relating to the number of hours which should give a maximum output. How unstatesmanlike it would be to regulate the hours of labour solely by this criterion we all realise. But the maximum of productive hours when quantitatively demonstrated does, at least, give us a *terminus ab quo*, because if 70 hours' work do not produce a greater output than 60 hours' toil, the extra ten hours are without any justification.

The quantitative demonstration of the need for curtailing hours in particular industries has been furnished by Dr. H. M. Vernon in a paper destined to become a classic.[1]

Table XI summarises Dr. Vernon's study of the outputs of 100 women engaged upon the moderately heavy labour of turning fuze bodies. It will be seen that a nominal reduction of 10½ hours and an actual reduction of 8½ increased the gross output by 8 per cent. That this contrast is really a function of the hours worked and not of increasing skill, was shown by studying the outputs of

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[1] Memorandum No. 12, Health of Munitions Workers Committee, reprinted in the Committee's Interim Report, Cd. 8511, p. 17.

TABLE XI.—100 *Women Turning Fuze Bodies (Vernon).*

Week ending	Actual hours of work per week.		Nominal hours of work per week.	Hours of broken time per week.		Relative output per working hour.		Hours of work × relative output.	Remarks concerning output.
Nov. 14	62·0	68·2	67·5	5·5	6·6	98	109	6,820	Hourly output fairly steady.
,, 21	68·8		75·5	6·7		99			
,, 28	66·7		75·0	8·3		102			
Dec. 5	70·9		77·2	6·3		96			
,, 12	69·1		76·2	7·1		99			
,, 19	71·8		77·3	5·5		107			Typical rise in hourly output before holiday.
,, 26	41·8		46·0	4·2		105			
Jan. 2	32·8		—	—		89			Great fall in hourly output immediately after holiday.
,, 9	65·2	68·6	69·3	4·1	5·7	113	111	7,615	Subsequent considerable increase of hourly output, whilst total output rises to a maximum 12 per cent. greater than that of pre-Christmas period.
,, 16	70·3		77·2	6·9		107			
,, 23	70·3		76·3	6·0		112			
,, 30	62·4	61·6	68·5	6·1	5·9	111	107	6,591	Reduction of hours of labour from 74·3 to 67·5 has no immediate effect on hourly output hence a considerable reduction of total output.
Feb. 6	60·8		66·5	5·7		102			
,, 13	49·2	48·4	52·0	2·8	3·6	108			Temporary shortage of material and reduction in hours of labour.
,, 20	47·6		52·0	4·4		106			
,, 27	61·4	59·7	66·5	5·1	4·6	118	123	7,343	Effect of shorter hours of labour now established and hourly output reaches a maximum. Total output 8 per cent. greater than in pre-Christmas period.
Mar. 5	62·2		66·5	4·3		125			
,, 12 ...	54·8		58·5	3·7		127			
,, 19	62·1		66·5	4·4		121			
,, 26 ...	60·4		66·5	6·1		121			
Apr. 2	58·6		64·8	6·2		121			
,, 9	54·9		58·5	3·6		121			
,, 16 ...	62·9		66·5	3·6		126			Typical rise in hourly output before holiday (Easter).
,, 23 ...	47·0		49·5	2·5		125			

groups of women who, prior to the statistical period, had different lengths of service and ascertaining that the differences thus to be explained were within the limits of chance variation.

The Table XII, which accounts for 27 men sizing fuze bodies, a strenuous task, displays an even more striking difference. A climax is reached in Dr. Vernon's example (Table XIII) of 9 youths sizing base plugs, where a reduction of no less than 13 hours a week did not sensibly diminish gross output. These two latter examples are not statistically so important as the more numerous observations of women. If the differences displayed are a consequence of fatigue engendered by excessive hours, we ought to find that when the labour is physically light a reduction of hours is not attended by such great advantages. This is what Dr. Vernon did find. The operation of boring top caps for fuzes is not a strenuous task; Table XIV traces the history of 17 youths engaged upon this work.

TABLE XII.—27 *Men Sizing Fuze Bodies* (*Vernon*).

Statistical period.	Average hours of actual work.	Average (relatively) hourly output.	Hours-work.
6 weeks preceding Christmas (Nov. 8—Dec. 19)	61·5	100	6,150
2 weeks at Christmas (Dec. 20—Jan. 2)	38·3	89	—
6 weeks after Christmas (Jan. 3—Feb. 13)	51·1	109	5,570
8 weeks later (Feb. 21—April 16)	55·4	122	6,759
2 weeks at Easter (April 17—April 30)	41·0	112	—
3 weeks later (May 1—May 21)	56·2	124	6,969

TABLE XIII.—9 *Youths Sizing Base Plugs* (*Vernon*).

Statistical period.	Average hours of actual work.	Average (relatively) hourly output.	Hours-work.
5 weeks preceding Christmas (Nov. 15—Dec. 19)	68·3	100	6,830
2 weeks at Christmas (Dec. 20—Jan. 2)	46·3	106	—
4 weeks after Christmas (Jan. 3—Jan. 30)	70·3	116	8,155
11 weeks later (Jan. 31—April 16)	57·0	142	8,094
2 weeks at Easter (April 17—April 30)	42·1	135	—
3 weeks later (May 1—May 21)	60·9	155	9,440

TABLE XIV.—17 *Youths Boring Top Caps* (*Vernon*).

Statistical period.	Average hours of actual work.	Average hours of broken time.	Average (relatively) hourly output.	Hours × output.
5 weeks preceding Christmas (Nov. 15—Dec. 19)	75·6	2·9	100	7,560
2 weeks at Christmas	50·0	2·7	106	—
6 weeks after Christmas (Jan. 3—Feb. 13)	70·9	4·6	106	7,515
8 weeks later (Feb. 21—April 16)	59·4	4·4	108	6,415
2 weeks at Easter (April 17—April 30)	40·8	4·6	95	—

A weekly reduction of more than 11 hours did somewhat increase the hourly rate of production, but the gross production fell. Where it is merely a question of securing a maximum output, longer hours are needed upon this light labour than were permissible for the heavier tasks.

I should like to emphasise the importance of this first-rate piece of statistical investigation. We find, taking Dr. Vernon's first illustration, that to immure women within the walls of a factory 8½ hours longer than a particular time actually results in our obtaining fewer manufactured articles, and cannot, therefore, be defended on any grounds. By the application of this statistical method, plotting gross outputs as ordinates against working hours as abscissae it will, as Dr. Vernon has elsewhere remarked, be generally possible to discover the critical point for any task at which lengthening the working day becomes crudely bad business. Humanity and perhaps policy, as Burke said, might justify us in interfering at a level well below the critical value ; certainly no policy would justify non-interference at that point. This research has placed at the disposal of the State, the entrepreneur, or the Trade Union, a new and valuable instrument of regulation.

VI (*a*).—INDUSTRIAL ACCIDENTS : *Personal Factors.*

I now take up for a moment the question of industrial accidents, a matter to which we have devoted an amount of attention, warranted by its practical importance.

A preliminary question is whether industrial accidents are really accidents at all in the sense of events happening at random to persons all exposed equally to the interplay of a large number of cause groups. The answer to this question is that the distribution of accidents amongst those exposed to risk does not correspond to any simple schema of pure chance with which we are familiar. To test the point a somewhat elaborate study has been made of the frequency distributions of multiple accidents upon groups of workers exposed to risk through definite periods. Illustrations are furnished in Table XV. The second column shows the actual frequency of persons sustaining 0, 1, 2, &c., accidents through the period; the third column the expected numbers assuming that the distribution were effected by chance the problem being supposed to be to allocate at random *n* balls in N pigeon-holes. The fourth column is a theoretical distribution arrived at on the assumption that the sustaining of an accident renders the victim more liable in a certain measure to incur a second accident, while the fifth column is the distribution which would result on the assumption of unequal initial liabilities to accidents characterising individuals. It is plain that the two modifications of the pure chance schema correspond better to the observed facts than does the original hypothesis. Table XVI, which traces the previous accident record of women who did and women who did not sustain accidents in a certain month likewise illustrates the particularity of accident data.

TABLE XV.—*Accidents. Period, February* 13, 1918—*March* 20, 1918.

Number of accidents.	Number of persons.	Chance distribution.	Biassed chance.	Unequal liability.
		A SHOP.		
0	447	406	452	442
1	132	189	117	140
2	43	45	56	45
3	21	7	18	14
4	3	1	4	5
5	2	0·1	1	2
Total	648	648·1	648	648
		B SHOP.		
0	397	379	403	398
1	133	163	125	136
2	47	36	44	38
3	5	5	10	10
4	1	1	2	2
5	—	0·1	0·3	0·6
6	—			
7	1			
Total	584	584·1	584·3	584·6

TABLE XVI.—*Previous Experience of Two Samples of Workers.*

Month.	Accidents per head of sample having *no* accidents in January (61).	Accidents per head of sample having had accidents in January (55).
December	·11	·63
November	·16	·93
October	·43	·91

TABLE XVII.—*Cuts per* 10,000 *Lathe Workers per Week at Factory A.* (*Vernon*).

Time interval in which cuts were treated.	Day Shift.							
	Men.				Women.			
	Nov. 2, 1915, to Jan. 31, 1916.	Feb. 1, 1916, to July 24, 1916.	July 25, 1916, to Apr. 1. 1917.	Apr. 2, 1917, to Dec. 15, 1917.	Nov. 2, 1915, to Jan. 31, 1916.	Feb. 1, 1916, to July 24, 1916.	July 25, 1916, to Apr. 1 1917.	Apr. 2, 1917, to Dec. 15, 1917.
7·6 to 7·35	9	19	14	16	2	3	7	7
7·36 to 8·35	*24*	*18*	*36*	*34*	*17*	*10*	*14*	*15*
8·36 to 9·35	*33*	*40*	*45*	*55*	*26*	*20*	*23*	*33*
9·36 to 10·35	*64*	*50*	*48*	*65*	*72*	*42*	*40*	*47*
10·36 to 11·35	*54*	*58*	*62*	*75*	*90*	*41*	*42*	*50*
11·36 to 12·5	36	43	56	66	57	28	37	43
1·6 to 1·35	67	56	36	36	63	24	23	26
1·36 to 2·35	*50*	*54*	*58*	*55*	*80*	*32*	*37*	*42*
2·36 to 3·35	*46*	*47*	*54*	*61*	*72*	*30*	*36*	*42*
3·36 to 4·35	*48*	*46*	*52*	*58*	*80*	*38*	*39*	*37*
4·36 to 5·35	*44*	*32*	*42*	*72*	*63*	*27*	*30*	*35*
5·36 to 5·51 or 6·5	39	38	38	73	52	18	38	52
6·21 to 6·35	39	—	—	—	52	—	—	—
6·36 to 7·20	*42*	—	—	—	*52*	—	—	—
7·21 to 8·5	*36*	—	—	—	*48*	—	—	—
8·6 to 8·35	14	—	—	—	47	—	—	—
Total cases in whole day....	490	416	460	521	666	271	309	332
Actual number of cuts recorded in statistical period	660	924	1,380	1.333	1,145	940	1,486	1,507

Time interval in which cuts were treated.	Night Shift.			
	Men.		Women.	
	Feb. 1, 1916, to Apr. 1, 1917.	Apr. 2, 1917, to Dec. 15, 1917.	Feb. 1, 1916, to Apr. 1, 1917.	Apr. 2, 1917, to Dec. 15, 1917.
6·36 to 7·5	35	34	19	12
7·6 to 8·5	*51*	*68*	*34*	*27*
8·6 to 9·5	*46*	*60*	*30*	*36*
9·6 to 10·5	*43*	*68*	*32*	*33*
10·6 to 10·35	38	49	28	39
11·36 to 11·50	28	36	25	14
11·51 to 12·50	*38*	*42*	*30*	*28*
12·51 to 1·50	*35*	*51*	*27*	*27*
1·51 to 2·50	*38*	*36*	*27*	*33*
2·51 to 3·5	16	31	25	24
3·36 to 3·50	31	36	22	15
3·51 to 4·35	*28*	*43*	*21*	*22*
4·36 to 5·20	*30*	*37*	*21*	*20*
5·21 to 6·5	*25*	*48*	*23*	*29*
6·6 to 6·35	36	39	20	33
Total cases in whole night	380	502	277	287
Actual number of cuts recorded in statistical period	1,125	847	1,085	819

			Duration of period.
Length of day shifts	Nov. 2, 1915, to Jan. 31, 1916	75 hrs. (includ. Sunday labour)	3 months
	Feb. 1, 1916, to July 24, 1916	64½ hrs. (includ. Sunday labour)	6 ,,
	July 25, 1916, to Apr. 1, 1917	58½ hrs. (no Sunday labour)....	8 ,,
	Apr. 2, 1917, to Dec. 15, 1917	54½ hrs. (no Sunday labour)....	8½ ,,

Length of night shifts:
Feb. 1, 1916, to April 1, 1917, 62½ hrs. (Period, 14 months).
Apr. 2, 1917, to Dec. 15, 1917, 60 or 62½ hrs. (Period, 8½ mths.).

I do not, however, propose to enlarge upon the topic nor even to criticise the probability schemata usually employed in such cases, because the extremely important theoretical considerations involved have formed the object of a special research by Mr. Udny Yule and myself, which we hope soon to have leisure to complete and publish. I would merely observe that the methods necessary to elucidate this problem of distributing accidents and devised for its solution seem to be of wider application in statistical practice.

These results are perhaps sufficient to demonstrate that accidents are by no means impartially distributed amongst workers ostensibly equally exposed to risk and entitle us to infer that a careful and continuous scrutiny of accident records with gradual elimination of "susceptibles" would appreciably reduce the gross number of accidents, and, therefore, both the sum total of physical incapacity and the financial liability of employers. This is evidence in favour of increasing the scope of medical inspection and regulation in the domain of industry.

VI (*b*).—Industrial Accidents: *General Factors.*

Leaving the topic of such individual variations and passing to the general environmental conditions which determine the frequency of accidents, I select two factors, the importance of which has been fully displayed in Dr. H. M. Vernon's valuable memorandum on the subject.[1] The first is the length of working hours well illustrated in Table XVII. Both the total numbers of accidents and the rapidity of increase from the beginning of the shift indicate the serious effect of the long hours in the earlier period upon the women workers. Another point brought out by Dr. Vernon is the relation between external temperature and frequency of accidents, which is exemplified in Table XVIII and Table XVIIIa. The contrasts

Table XVIII.—*Accidents per Month at Factory C in Relation to Temperature.*

Statistical period.	Cuts per 10,000 workers per week.		Mean external temperature. Deg. Fahr.	Relative output of shells.	Average number of workers in factory.	
	Men.	Women.			Men.	Women.
Oct. 8 to Nov. 4	1,168	769	49·5	85	1,291	312
Nov. 5 to Dec. 16	1,189	841	42·1	88	1,280	410
Dec. 17 to Jan. 20	1,086	1,035	38·9	103	1,282	500
Jan. 21 to Feb. 17	1,148	1,030	32·9	101	1,241	592
Feb. 18 to Mar. 17	885	801	38·6	106	1,147	718
Mar. 18 to Apr. 20	801	754	40·3	106	1,068	779
Apr. 21 to May 12	644	601	51·3	106	1,002	718

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[1] Health of Munition Workers Committee, Memo. No. 21, "An Investigation of the Factors Concerned in the Causation of Industrial Accidents," by H. M. Vernon, M.D. London, 1918.

Table XVIIIa.—*Accidents per Spell at Factory C in Relation to Temperature.*

Time of spell.	Women					Men.				
	33° or less.	33°—37°	38°—42°	43°—47°	48° or more.	32° or less.	33°—37°	38°—42°	43°—47°	48 or more.
Day Shift—										
6 to 9 a.m.	1·75	1·08	1·05	0·64	0·87	4·33	2·95	2·63	2·33	2·29
9 30 to 1 p.m.	3·00	2·09	1·91	1·46	2·00	4·82	4·06	3·97	3·53	3·43
2 to 5 p.m.	(1·80)	1·61	1·52	1·86	1·27	(4·08)	3·57	3·63	2·81	2·36
Night Shift—										
5.30 to 9 a.m.	1·56	1·77	1·14	1·73	1·00	5·61	4·68	2·93	4·92	4·10
9.30 to 2 a.m.	1·44	1·80	1·83	1·42	(1·28)	3·96	4·24	2·33	4·00	(3·59)
2.45 to 6 a.m.	0·74	0·84	0·83	0·58	(0·52)	2·14	2·33	2·50	2·42	(2·17)
Average number of cuts in each spell	1·72	1·53	1·38	1·28	1·16	4·16	3·64	3·00	3·33	2·99
Total number of spells investigated	162	267	142	85	64	162	267	142	85	64

are not so remarkable as in the previous Table, but the deviations are sufficient to suggest that temperature, important in other connections, is not without influence in the causation of accidents.

VII.—THE PHYSIQUE OF INDUSTRIAL WORKERS.

I will conclude this Paper as I began it by reference to some generalities.

The prevalence of physical imperfections in this country has now become a subject of general comment owing to speeches of politicians. Whether the unfavourable comparisons sought to be instituted between the population of England and that of France are just, how far the classificatory standards are similar, what allowance has been made for differing degrees of industrialisation, in a word, what may be the real statistical bases of these judgments, are questions not likely to be answered in political speeches, nor would, indeed, those who listen to such speeches be interested in the answers. But it is due to those who planned the researches into industrial hygiene, which I am describing, to remark that they promoted inquiries into the physique of factory workers long before the subject had a platform value. One result of such an investigation is to be found in Capt. T. H. Agnew's "Report on the Health "and Physical Condition of Male Munition Workers."[1]

Capt. Agnew investigated, *inter alia*, the relation of general health to length of employment, hours and nature of work. He arranged his material in a series of four-fold tables, too numerous to be reproduced here, and was led to adopt the following conclusions:— "The comparison shows that the percentage in Class A (the best "standard of health and physique) is less among those working "longer hours, that is 70 hours or over for men and 60 hours or "over for boys. In three of the tables the difference is more than "twice the probable error, and the combined improbability that "all four tables should merely, as a result of random sampling, "give the observed deviation is considerable, indeed, the odds "against it are about 99 to 1. The long hours, therefore, appear "definitely prejudicial to physical well-being, but it is necessary "to be sure that this deduction is not deceptive and that it is not "due to the intervention of the third variable, namely, length of "employment. Thus it might happen that a larger proportion "of the employees who had been engaged for longer periods, say, "over twelve months, worked shorter hours, and that they were "by a process of selective elimination physically fitter, quite inde-

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[1] Interim Report of the Health of Munition Workers Committee, Cd. 8511, 1917, pp. 86–109.

"pendently of the fact of working shorter hours. In this way a "spurious association between short hours and physical fitness "might arise." Capt. Agnew accordingly investigated the point by means of special tabulations, but found that the relation between long hours and physical unfitness could not thus be explained. He observes :—"It is thus probably permissible to draw from the "data the conclusion that long hours seem to exercise a prejudicial "effect upon average general health. The exact intensity of this "effect cannot, of course, be measured by data of this kind, but "if we combine all the results for post-war men, it appears that "22·1 per cent. of the men working less than 70 hours are in a "physical class below A, and 31·4 per cent. of those working 70 or "more hours. Of the boys, 6·7 per cent. and 10·6 per cent. respectively are the percentages amongst those working less than "60 hours, and for those working 60 hours or more. This difference "is a serious one."

VIII.—CONCLUSIONS.

I hope now to have sufficiently illustrated the kind of work which has been undertaken under the auspices of the Ministry of Munitions to throw light upon the conditions determining the efficiency of industrial labourers. It can be truthfully urged that in many cases we have done little more than provide a quantitative estimate of ill-effects which it needed little sagacity to postulate, and that in others, even if the results are both qualitatively and quantitatively novel, not much has been achieved beyond demonstrating that something more ought to be attempted. Neither assertion is a reproach to the investigators; both point an important moral for the period of reconstruction.

The inanimate side of industry, the details of production, the quantities of goods manufactured, the nature and powers of the machines, are all matters which can be adequately described. Such is not the case of the ultimate producer; of the circumstances which determine his, or her, efficiency we are still very imperfectly informed, and too frequently wrap up our ignorance in a cloak of rhetoric.

I look forward, although not with confidence, for of the many offspring generated between the sire "Reconstruction" and the dam "Peace," only a few will be born alive, to the time when some future fellow of the Society may render a complete account of the physiological statistics of industry perhaps treating the results here mentioned with that benevolent patronage which is the portion of the isolated workers who lived before the dawn of a scientific age.

DISCUSSION ON CAPTAIN GREENWOOD'S PAPER.

DR. BROWNLEE, in proposing a vote of thanks, said he had much pleasure in thanking Captain Greenwood for his most interesting Paper. As Captain Greenwood had said towards the conclusion, the subject was one on which they had at present very little accurate information. The method, even of making such investigations, was still in its infancy. It was difficult to settle before the inquiries were begun exactly what ought to be measured, and it was often only after the work was well on the way that it was discovered that the original specification of the lines of research failed in many respects to give the information desired. In addition, the work of the inquiry was an extra strain on the management, and there was a tendency to annoyance on the part of those administrating if arrangements once made were overturned. It must be a matter of congratulation when it is considered that in spite of these difficulties the scientific workers had managed in the limited time and under war conditions to collect so much information. In criticism of one or two points, it could be said that the statistics regarding the wastage of the factories presented certain difficulties. The divisions in which the persons who left were tabulated were: (1) those who left from ill-health; (2) those who left from a sufficient reason; and (3) those who left from no sufficient reason. The difficulty of distinguishing between a reason deemed sufficient or insufficient is considerable. A reason which might not appear to be sufficient to the bulk of those inquiring into the matter might seem quite sufficient to the person who left. A certain degree of nervous irritability might lead to a person leaving. To the housewife annoyed by her maids that might not seem sufficient, but the maid's point of view might be different. He thought, therefore, the better method, except, perhaps, during the first month or so, would be to put these three classes together. It was interesting to note how constant the rate of leaving became after a time. The numbers affected were, it is true, small, but when graduated so as to give a constant rate of leaving, the difference made in the figures would be very small. Something analogous to the constant cause of death assumed by Makeham to represent a factor in the death-rate in individuals at different ages might be assumed to apply in this case, using the phrase, cause of death, in the sense of ceasing to be of effective use in the factory. There was one point that had always been of special interest to him, and that was the influence of night work. It was the first time he had seen any statistical information regarding the effects of night work, and he thought the information was of the first importance. He had been responsible for a great deal of night work under different conditions, and he had always left the conditions he found obtaining untouched. He had seen nurses on and off night duty for alternate periods of three months and also for monthly periods. He thought that the nurses went off night duty under the three-monthly system more tired than under the monthly, but on asking which they preferred, some preferred three months and some one month, so that he could never get any accurate information as to which period was really the best. It would seem now that weekly periods would be better, but he did not know how that would appeal to the matrons of hospitals; it would certainly lead to the staff having more time off between the changes, and might, therefore, be generally popular. The habit of sleeping was one of the points; it would seem that this habit might be better cultivated by frequent change from day to night duty. What seemed quite clear, however, was that long periods of night duty should not be encouraged. The information on the hours of labour and output and upon accidents was also exceedingly interesting. The question of accidents to the same person raised the interesting point as to the reason why persons should have accidents. Was it that they had a habit of having accidents, or having had one accident, they became less self-confident, and, therefore, more liable to a second? He felt inclined to consider the first theory the more probable, and that also was the opinion of Captain Greenwood. The habit of accidents was well-known to all housewives; glass was broken by one maid at a rate which did not happen with another. He had seen himself breakages run through particular wards, and when the nurses were moved, the breakages moved along with them. If a habit of causing external accidents existed, it was probable, he thought, that a habit of personal accidents might also exist. The figures given by Captain Greenwood were especially interesting, and he thought that when they had figures on a larger scale these points might be satisfactorily determined. There was nothing more he especially wished to say, as there were many present who might wish to continue, having a more intimate knowledge of the subject than he possessed.

Professor EDGEWORTH thought that Captain Greenwood's Paper made important contributions both to statistics and economics. In both departments the maxim which Captain Greenwood had adopted, to measure and express phenomena in numbers, afforded guidance. The maxim was not, indeed, equally applicable to both departments. A distinction might be drawn between the two phrases which Kelvin had used: to "measure" and to "express "in numbers." There was a kind of measurement which could not be expressed in numbers, or in terms of units. It gave rise not to equations, but to *inequations*, as that one quantity was greater than another. Proportions relating to psychical quantity were mostly of this character. Members of the Statistical Society might not think much of such loose statements; but they could not dispense with this moral—or hedonic—arithmetic in their capacity of economists; a character which had belonged to the

Society since the 'fifties of the last century. To take an instance from an economic phenomenon now painfully prominent, namely, taxation; it was proper to take account of the *sacrifice* imposed on the taxpayer, although no exact numerical measure for that subjective quantity was obtainable. There was present that afternoon a distinguished investigator in these matters, Mr. Cohen Stuart, who had with great mathematical ability investigated questions like the following: whether, if you took by taxation one-tenth of a small income (or rather one-tenth of the amount by which the income exceeded a certain minimum) a greater sacrifice would be inflicted on the taxpayer than if one-tenth were taken from a large income. Opinions might differ on that question, as Dr. Marshall had lately said.[1] But there could hardly be any difference of opinion as to Dr. Marshall's statement that the "personal hurt" caused by obtaining 1,000*l.* of additional revenue through levies of 20*l.* from each of fifty incomes of 200*l.* was decidedly greater than the hurt caused by taking the required amount from a single income of 10,000*l.* These conceptions were not irrelevant to the present subject. He expected in the future not only, with Captain Greenwood, more perfect "physiological statistics of "industry," but also psychical investigations as to the quantity of discomfort and fatigue which might attend different arrangements of work. Referring to the analogy with vital statistics which Captain Greenwood had presented, he, the speaker, did not understand that because departure from an industry was likened to decease, it was meant to represent such change as an evil. Such an implication was, perhaps, latent in the interesting articles on the instability of employment which M. Bellom had lately contributed to *L'Economiste Français* (August, 1918, and subsequent articles). He, Professor Edgeworth, submitted that the capacity to change one's occupation was apt to prove advantageous in wartime. Industrial troubles suggested an additional argument against rigid division of labour. If large numbers of the general public were qualified to take on at a pinch work like that of transportation, the community would be not so much at the mercy of the operatives belonging to a particular industry.

Dr. E. L. Collis said he desired to thank the Chairman for allowing him to take part in the discussion, because he had had the privilege of watching the investigations of which Captain Greenwood had been speaking throughout. It was extremely interesting to find that investigations could express as facts some things which one previously only guessed at to be truths, and so to see one's previous ideas based on the foundation of statistical data. One of the inquiries to which Captain Greenwood had referred was intensely interesting, because it proved how dangerous it was to jump to conclusions. During war-time night shifts became necessary, and in the question of day work *versus* night work, there were some at the time the investigation was started, who were convinced in their own minds that continuous night work was better than intermittent night work. Indeed, he would confess that he was himself advising that in regard to the employment of people at night, this principle should be taken into consideration, and that workers should be employed at night work for a longer period than weeks, or fortnights. The investigation which Captain Greenwood had referred to was then carried out, and he, Dr. Collis, had, humbly, to cry "Peccavi"—he was wrong. One's ideas of the physiological change being more permanent if the workers were employed for a longer period, however, right in theory, were wrong under the conditions of present social life. He thought that instance gave a practical meaning to some of these inquiries. It might interest them possibly to know how, in another way, the inquiries which had been set before them in statistical form came to be of value. At one time during the war the output of munitions overtook the requirements, and it was decided to make a cut in the programme, and the Ministry of Munitions thought this was going to entail the dismissal of some 60,000 workers. Various points were considered to avoid this dismissal, for instance, as to whether they could lessen the necessity by cutting down the hours of work. He had been speaking a good deal before about cutting down hours of work, and suggesting that if only the hours were cut down, they would increase the output they were trying to obtain. They had refused then to listen to any such talk from him; but then came the question of their justifying their own point when they wanted to reduce the output, say, from 100 to 80. He had told them if they shortened the hours, that they would probably not get an output of 80 but 120, and have to build new yards in which to place their products. This made so much impression that they did not reduce the hours. Then they asked what they ought to do; and he told them that if they wanted to be quite certain of reducing the output and not discharging the workers, they should lengthen the hours. They had told him that would be very unpopular, as they did not intend to raise the wages, and again asked what they should do. He told them that Captain Greenwood had just been busy on the wastage of workers and labour turnover; and produced Captain Greenwood's figures, at which they were astonished—but asked what they meant? He told them it meant that if they left things alone, the 60,000 workers would pass out of the factory quite naturally, if they ceased to engage fresh workers. The Sub-Committee on which he was sitting considered the matter very carefully, and they managed to prolong the reconsideration of the question for quite a long time, in fact, so long as to account for most of the time during which the workers were to have been dismissed; and nothing at all was happening in the labour market; it was not being flooded by the 40,000 who left, and that they had no need to trouble themselves about the other 20,000. That was the result of having knowledge in one's hands. In the first place, they would have shortened the hours, increased the output, and disorganised the programme; in the second place, they would have taken some strenuous efforts to move people about the country, which were entirely unnecessary and uncalled for. With regard to the accidents data, to which attention had been called, they had a very important practical side. In the past, every effort that could be thought of had been made to reduce the occurrence of industrial accidents; but those efforts had practically all been concentrated on the guarding of machinery and doing what they could to make processes less dangerous. In the last few years, further attention had been drawn, especially from America, to the fact that some 75 per cent to 80 per cent. of all accidents were under the control of the worker, and do what they would to guard machinery and make processes less dangerous, they would only effect a saving of some 20 to 25 per cent. of accidents, whereas the other 75 to 80 per cent. would remain. The point had now been brought out that certain individual workers had a predilection to accidents, and that the old proverb that the burnt child was afraid of fire was false. There was a probability of a great reduction being made in industrial accidents by paying attention to the point of selecting their workers and eliminating those who showed a special predilection to suffer accidents from a particular process. The work carried out in relation to the food problem during the war, especially among those who were being housed in the hostels, was of very great importance. The dietaries were studied, and the effect, as far as it could be estimated, was a very great help. Captain Greenwood was hardly aware of the value of his own work, both in advising the managers of the hostels as to what food should be procured to give the workers the necessary energy to carry out their work, and in the information given to the Food Ministry itself. He supposed Captain Greenwood would hardly lay stress on it here; but in bringing before them statistical data, he had rather hidden from them the direct value of his work during the war. At the conclusion of his paper, he was rather suggesting that he had only marked out territory for others to develop, and was only a pioneer who saw some gold, but did not pick up anything. As a matter of fact, he had dug his spade in firmly, and there had already grown a certain harvest from the work he had embarked upon, which harvest would undoubtedly be far greater in the future.

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[1] *After-War Problems*, edited by W. H. Dawson.

Dr. Stamp said he would be very diffident in passing any critical remarks on a subject which was quite out of his own line, but there was one point which touched matters he was personally interested in. He was very surprised at the preamble to the paragraph about night work and day work. If it were important on that small showing, how much more important it must be if there was any move to *increase* night work. They were, surely, face to face to-day with an immense campaign for the increase of night work. The great question of the day was how they could increase the number of good things for people to enjoy with fewer hours of labour? How could they make the total product of labour and capital greater, so that the share of the worker need not be diminished, while he was, in fact, having greater leisure and shorter hours? The most important practical answer that was now receiving an immense following was that of Lord Leverhulme. He asked: "Why are you receiving for the total co-operation of labour and "capital such a small amount as you are? The reason is that "some of your agents of production are idle when they ought "not to be, namely, your buildings and machinery. Those things "do not need rest. You could work them all the hours there are, "and by so doing you could spread your oncost over the same "quantity of goods and make the product of the co-operation of "labour and capital far greater." He was, therefore, saying that what one ought to do was to increase the number of industries in which a shift system was at work, in order that they might get the utmost out of their machinery and buildings. If that programme was a true one (and it certainly was receiving great attention by industrial thinkers), they were face to face with an immense increase of night work—because, if buildings and machinery were to be kept going for 24 hours, it meant they must have at least three shifts of workers to work in the buildings. If that was to be the case, or there was any movement in that direction, how much more important than Captain Greenwood had claimed was the settlement of how best to carry out that night work with proper regard to efficiency and the health of the worker! What a vista of possibilities was opened out by Captain Greenwood. He very modestly claimed to be a pioneer, but, as Dr. Collis had said, he seemed to have harvested something himself. After a paper like the one they had heard, the meaning of the words "*Vital* Statistics" seemed to take up something quite new. They had previously thought of it as the registration of the results of births and deaths after they occurred, which, however important to the community, did not help them much to alter the situation. Here they had vital statistics in a far truer sense, in that they were studying, by statistical methods, things which were *vital* to the health of the workers. Hitherto, they had had statistics with regard to their wages, their housing, children, and all those things; but they had here a thing which might help them to mend their errors of treatment in other matters, in what, after all, was the most important thing to them, viz., the way they spent the bulk of their lives. It seemed to indicate that they were on the threshold of new possibilities in the application of statistical methods. Professor Edgeworth was always interesting when he directed his observations to the various uses to which statistics could be put, and the degree of caution, and so on, that was to be observed. He had come into that room little expecting that the province Captain Greenwood had taken up could in any way be connected with the province in which he was interested; but Professor Edgeworth had lightly got on to the connecting link in referring to the determination of relative "hurt." If they tried to determine the degree of "hurt" by the quality or pungency of the language used by the person hurt, he thought one could controvert the theory at once; because he was quite sure that the language of the super-taxpayer, in volume and degree, was not proportionate to the language used by the payers amongst the working classes, paying in the mass an equal sum. It seemed to him, in fact, that the smaller amount they had to pay the more fuss they made about it. Dr. Marshall's theory was only tenable in considering the aggregate "hurt" of one man, as compared with the "hurt" of ten men on the first imposition of the tax. He believed he was using a medical term not really out of its ordinary signification when he said there was such a thing as becoming "tolerant" to doses of taxation, and if they had the man who had an income of 10,000*l.*, which had never been actually an income of 10,000*l.*, but always to him 5,000*l.*, what he felt was *increases* in the taxation on the 10,000*l.*, very largely "tolerance" destroyed the doctrine of sacrifice when one attempted to carry it out in a strictly quantitative sense.

Mr. H. R. BEETON said the question of night work, in relation to industrial efficiency, was one on which he could not profess to any quantitative knowledge, but his observation of the habits of night workers led him to conclude that their inefficiency might be due to nervous strain, involved in the attempt to reconcile their habits to those of the majority of the community. A man on a night shift was not, in fact, content to accept his inverted conditions of life. He burned the candle at both ends, because, although he worked while others slept, he did not sleep while others worked. He noticed that they over-fatigued themselves in their pursuit of leisure which they could only enjoy in association with others differently circumstanced. It, therefore, occurred to him that if, in order to increase production, it were necessary to economise capital by means of night shifts, it might be done with impunity, provided it were done upon a sufficiently large scale. In any industrial communities in which a sufficiently large number of night workers were employed, it might be possible so to adjust their conditions of life as to provide appropriate diversion of work consistently with requisite and regular sleep, and so really avoid the strain to which they were at present subjected. With regard to the predisposition to accidents, he had not been able to gather to what that was due. He wondered whether some people were not by nature more clumsy than others—whether their fingers were not all thumbs, and whether they were not more susceptible to mischance in handling dangerous tools in consequence, or, again, whether the predisposition to accidents on the part of persons who had already had an accident might be due to nervousness. They might be afraid when they got to the edge of the precipice that they might topple over. He would like to know whether any light could be thrown on the extraordinary predisposition which was observable, and which appeared to contradict the assumption of the proverb that a burnt child dreaded the fire.

Dr. DUDFIELD said, with regard to the question of accidents, he thought it was a great mistake to group everything under the term "accidents." Accidents varied very much in severity, and two factors came into play: (i) there were workers with bad sight, or defective muscular co-ordination, who were, therefore, liable to accident; (ii) again, it was common knowledge that very trifling accidents were very frequently recorded on account of the attractions which were offered in the shape of holidays and compensation. Those two factors required to be considered. He did not dispute for a moment there was a greater liability to genuine "accidents" among workers who were over-fatigued. With regard to what Dr. Greenwood called discontinuance of night service, he wished to call attention to the practice at sea. They had night service continuously, but no man was on duty the same hour every night. By the intervention of "dog watches," a man was on deck one night from 8 to 12, would be below deck during those hours on the following night, and on deck at 12 to 4. Such arrangement appeared to him to carry the principle of continuous night work, with variation, to its utmost limit.

Dr. STEVENSON said, as a representative of the ignorant public with regard to these matters, he wished to ask whether, on the subject, both of the relation of the length of hours and of night work to volume of output, the material for a statistical answer on a large scale was not provided in the records of piece-workers' output. He supposed they had all noticed that in recent demands of trade unions for modification of the conditions of employment, along with the claim for reduction of hours for dayworkers had gone a demand for increase in the remuneration for piece-work, on the assumption that the output of piece work would be diminished by the diminution in working hours. If that assumption was not only incorrect, but was the very opposite of the truth, the fact being that the amount of piece-work output would be increased by the diminution in the hours of work, then, surely, it was of great importance that that fact should be demonstrated on the largest possible scale, and one that would carry conviction to the workers concerned? He asked whether there was not a prospect of a test on that scale being afforded by examination of the records of payment for output by piece workers. For instance, the output of coal per man in the same collieries before and after the Eight Hours Act came into force should be capable of throwing light upon the optimum length of the working day in that occupation; and the relative output of day and night shifts in the same collieries might surely be used as a measure of the efficacy of day and night labour. It seemed as if, in these cases, the conditions other than those under investigation might be fairly constant, and so favourable to the test. In connection with another matter, Table 9 was introduced as illustrating the bearing of marital conditions upon continuity of employment amongst women; and he asked whether it would not be possible to answer the question very simply by classifying the workers in preceding tables as "single" or "married," so that it would be possible to see whether the "death-"rate" was higher amongst the married than amongst the single, and to what extent.

Dr. ISSERLIS said, with regard to Table VII, the conclusion was that the proportion of survivors diminished with age. There seemed no doubt at all that the proportion of survivors was smaller for ages over 22 than for ages under 22, but the table did not seem to bear out that the proportion of survivors went on diminishing with increasing ages. There were only two increases, 23 to 27 and 28 upwards. The difference, if anything, was the other way; but it was an insignificant one, one way or the other. He did not know very much about accidents in factories, but he had a suggestion to make as to whether it was not possible that the whole thing was a mental characteristic rather than anything else. Many who were not in factories had a pre-disposition to accidents. In his opinion, that would lead to very serious results in connection with edged tools. He himself very often dealt with figures, and frequently found himself making numerical slips. If, for instance, he said that six sevens were forty-three, that would mean many hours of work in a calculation to find out the mistake; and it seemed to him, if it meant a risk of losing one of his fingers, first of all he would appear on the accident list, and, secondly, he knew he had a habit of making such mistakes. He had also observed the same thing very much with his students. For many years he had been teaching; and in order to save himself trouble in the correction of exercises, he first of all took the work of two or three students whom he knew to be more or less reliable in order to see their results. He knew, if one man said the answer was 55, and the other 47, A. was more likely to be correct than B., both things depending on very elementary knowledge; and he said here was one who was in the habit of having little accidents. If it applied to machinery, it would lead to their figuring in the table of accidents. With regard to those who passed out, especially after a certain number of months, it became pretty steady. Had Captain Greenwood any information as to whether the passing out was due to their having acquired experience in the munition factory, and becoming more valuable workers, and naturally gravitating to better-paid positions? It was suggested by one of the previous speakers that it might be an advantage to the industrial world to have interchange of workers. In the teaching world it was a good thing for them to get experience and in the universities and colleges they acted on the theory that it was not a good thing for them to sit down in their posts, and so they passed out in a year or two, presumably to get better paid posts.

Captain GREENWOOD, in reply, said he was extremely gratified by the way in which they had received his paper. He was conscious of its manifold imperfections, and, therefore, the more grateful for their kindness. Many speakers had referred to the subject of night work, and he certainly owed an apology to the economists for having underrated the importance of night work in the future organisation of industry. He had not reflected that if one desired to make the maximum use of the plant with a minimum number of hours' work for the individual labourer, the regular organisation of night shifts might be necessary. He thought that the explanation of the actual inferiority of night work on the continuous shift system suggested in the paper and supported by Mr. Beeton, must be the correct one, and that Dr. Brownlee's experience was concordant with it. In an institution where the employees were under regular discipline, the normal routine could be regulated. It was possible, for instance, to invert the rhythm of bodily temperature (in accordance with which the temperature of the body was, in day-working men and anthropoids, at its maximum towards 7 p.m., and at its minimum towards 3 a.m.) in monkeys put to sleep during the day in sound and light proof boxes and kept active at night, but impossible to do so in, for instance, night-working Army bakers not so rigidly controlled. It was not possible to secure adequate rest and quiet for a minority of night workers living under urban conditions and tempted or compelled to devote part of what should be the time of rest to the amusements or work-a-day avocations of the majority. But if night work ceased to be a relatively rare exception, then night workers might be numerous enough to allow of an orderly change in social habits. Passing to the question of accidents, he had to observe that the data were subject to most of the objections mentioned by Dr. Dudfield, although the material, consisting of ambulance room records from particular Factories under good supervision, were probably the best ever accumulated. The accidents themselves were, with very few exceptions, slight, rarely causing absence from work for more than one or two days; in the vast majority the victim returned to duty at once. He would remark that the litigious element, to which Dr. Dudfield referred, the tendency to report an injury which a normal person might disregard, was one of the forms of "susceptibility" to accident and, from the industrial standpoint, as important as any other form. He felt confident that the factor of personal susceptibility to accident was of great importance. He and Miss Hilda Woods had found that the frequency with which a woman sustained accidents was not significantly correlated with her output, age, or sickness record. Whether such susceptibility were antecedent to employment or consequent upon sustaining a first accident, *i.e.*, whether, after one "real" accident, the victim became, as Mr. Beeton suggested, nervous and thenceforth increasingly liable to have other accidents, was a problem of great moment. Thus it was arguable that if an aeroplane pilot sustained a crash, even without physical injury to himself, an enduring effect might be produced upon his sub-consciousness—if the term be permitted—which would make him ever afterwards an unsafe pilot, although at the beginning he was perfectly fit. The existence of this possibility had made it expedient to attempt to solve the general problem, using the data of trivial industrial accidents which had come under notice. He and Mr. Yule had examined the problem from the algebraical point of view in considerable detail, and, from that point of view, the work had been exceptionally interesting. The application of their theoretical schemata to a large collection of data, had, he thought, made it highly probable that the *a priori* explanation was correct, that the unequal incidence was due to a personal factor already operative *before* any accident had occurred. Hence the deleterious effect of an accident upon an initially normal person was not, on the average, so serious as might have been feared. He was in complete agreement with Dr. Brownlee's remarks as to the doubtful value of the sub-classifications of causes for leaving and agreed that the general rate should usually alone be discussed. The graduation of the tables was not, perhaps, worth much labour, owing to the smallness of the experience at later months, and the consequent size of the errors of sampling. Professor Edgeworth had wondered whether he regarded a high wastage rate as unfavourable. From the point of view of an officer of the Ministry of Munitions, it was very unfavourable, since such wastage had cost the nation millions of pounds. No worker could attain his or her highest rate of output, even upon the simplest process, within five or six weeks of engagement, and the high wastage rates of the earlier months of service had necessarily diminished output because, even if those who left one factory immediately joined another, much of the special experience acquired was wasted. Dr. Isserlis' point as to the economic reason for wastage in ordinary life was an important one. Dr. Collis had very generously referred to the importance of the food investigation. It was true that they had had an opportunity of doing valuable work on that subject; but such value as it possessed was very largely due to Dr. Collis himself as head of the department. But for the energy of Dr. Collis, nobody would have been influenced by the results obtained in the research sub-section. Dr. Stevenson had asked two questions, the first being why the effect upon output of diminishing the length of shift had not been tested upon wider data. He (Captain Greenwood) thought that in the present state of knowledge it was very desirable to reduce comparisons to the simplest possible terms. When massed data were in question, the possible influence of many other variables than that of length of shift had to be considered, differences of skill, variations of machinery, supplies of raw material, &c. Such considerations influenced Dr. Vernon in the choice of groups which, although small, were homogeneous, and this choice seemed to him judicious. Dr. Stevenson further asked why the possible influence of married life upon the wastage results was left conjectural and not settled by tabulating the data throughout into married and single. The answer was that in only a small number of the factories investigated was the civil state recorded upon the index cards, and that the number giving full particulars was too small to justify any further subdivisions than those shown in the tables. In this connection he would add that Dr. Isserlis had justly pointed out that the phrasing of the remark under Table VII was not happy. He had merely wished to convey the impression that the women over 22 compared, as a whole, unfavourably with those under that age, so far as "heavy" factories were concerned, not that the rate of wastage was a continuous function of age. In conclusion, he desired again to thank the Society for its generous reception of a very slender contribution to a subject of immense importance.

The following candidates were elected Fellows of the Society :-

R. Ramaswamy Aiyengar, B.A.
J. E. Allen.
Arthur R. Crathorne.
Sir E. H. Holden, Bart.
Richard D. Holt.
F. W. Lanchester.
George A. Pavlovsky.
Ibrahim Rashad.
Sir Felix Schuster, Bart.
Joseph Edmund Stone.

Psychical Research and Statistical Method.

By Professor F. Y. Edgeworth, F.B.A.

[*] Some of the experiments by which the votaries of psychical research test their hypotheses deserve the attention of the statistician. For they afford particularly simple and clear-cut examples illustrating the use of the principal arm which the theory of probabilities brings to the aid of statistics. He who delights in the law of error may exercise himself in that law by considering problems like the following. One person—called the "agent"—having fixed attention on the colour or suit of a card, or other definite attribute of some instrument of chance; another person called the "re-agent" names a colour, suit or other attribute as being that which the agent envisaged. If in the course of continued trials the number of correct statements made by the re-agent exceeds the number that was to be expected as the result of mere chance, what is the probability that the excess of right guesses is due to some agency other than chance, such as "thought transference"? Some thousands of new experiments presenting this problem have been carefully conducted and skilfully interpreted by Dr. Coover under the auspices of his university and its generous trustee, Mr. Thomas W. Stanford. The trials which specially concern us comprise 100 batches of guesses, each batch consisting of 50 guesses as to the colour, suit, and number of spots pertaining to a card which the agent had before him. Each batch of guesses was furnished by a different re-agent; and there was generally[†] a different agent in each batch.

A general idea of the methods and results may be obtained from our Table I, which has been compiled from materials presented by Dr. Coover.

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[*] *Experiments in Psychical Research at Leland Stanford Junior University*, by John Coover, Fellow in Psychical Research and Assistant Professor of Psychology. Stanford University, California, 1917, 641 pp.

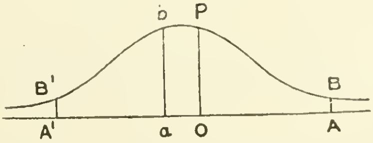
[†] This is not distinctly stated, but may be inferred from the statement that there were 97 agents.

TABLE I.—*Showing the frequency and significance of the right guesses among* 5,135 *guesses about the colour, suit, and number of spots pertaining to a card taken from a pack from which the twelve court cards had been removed.*

Number of row.	Description of row.	Colour.	Suit.	Number of spots.
1	Antecedent probability (p)	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{10}$
2	Number expected (np)	2,567·5	1,283·75	513·5
3	Number observed (X)	2,556	1,344	538
4	Deviation (X—np)	−11·5	+60·25	+ 24·5
5	Modulus (c)	50·670	43·882	30·402
6	Deviation ÷ modulus (ξ)	—·227	1·373	·806
7	Probability – integral (Q)	·252	·9478	·746
8	$\frac{1}{2}$ (1 ± Q)	·626	·026	·127

The first row shows the probability of a right guess, at a single trial, on the supposition that pure chance is the only agency at work. The second row shows the number of right guesses in 5,135 trials which is most probable on that supposition; or more exactly the mean number of right guesses in indefinitely prolonged experiments with sets of 5,135 trials. The fifth row shows the modulus ($=\sqrt{2}$ Standard Deviation) proper to the Bernouillian theory, the "combinational" modulus in the phrase of Lexis. In the sixth column $\xi = (X - np)/c$. In the seventh column $Q = 2\int_0^{\xi} \frac{1}{\sqrt{\pi}} e^{-x^2} dx$. The entry in the eighth column is taken as the probability of the observed deviation having occurred by chance.

It will be noticed that we are not following the common practice of those who employ the Law of Error—a practice followed by Dr. Coover—when we take as the measure of the sought probability, not 1 − Q in our notation, but *half* that fraction. The accompanying little figure will make our meaning clear. OA = O′A′ = ξ, the deviation relative to the standard called the modulus.



Commonly, and quite properly with respect to errors of observation, as the measure of the probability that such and such a deviation would occur by chance (or fortuitous error), there is taken the sum of the two areas to the right of A B and to the left of A′B′. But here, where we are considering the probability that a certain error in excess should have been produced by chance rather than by a certain agency making for excess, it is proper to use only the upper area, that which is to the right of B A, our $\frac{1}{2}(1 - Q)$.

Considering first probabilities which are independent of each other, we remark that the chance of as many as 1,344 right guesses about *suit* concurring with as many as 538 about number of spots $= \cdot 026 \times \cdot 127 = \cdot 0032$. We cannot so simply superimpose now the evidence afforded by *colour*. For right guesses about colour are not *independent* of those about suit. For if the guess as to *suit* is right, that about colour must be right also. The proper course appears to be to find first the probability that the observed number of right guesses as to colour should have occurred by chance; and then the probability that among those right guesses there should occur the observed number of right guesses as to suit. In the case before us there is the additional difficulty that the guesses about colour do not show an excess of right guesses (above the number which is to be expected on the hypothesis of pure chance) but contrariwise a defect. We are not, however, precluded by this circumstance from calculating the probability that the observed event would have occurred by chance.* That probability is now represented by the area to the right of an ordinate on the *left* of the centre, such as *a b*. The only change required for the calculation is to use the *plus* instead of the *minus* sign with Q. We thus may ascertain that the probability of the observed event—a number of wrong guesses not exceeding 11·5 is ·626. We have next to determine the probability that 2,556 guesses about colour having occurred, 1,344 among them should be also right as to suit. Whereas 1,278 is the number to be expected on the hypothesis of pure chance, the actual number is 1,344. There is therefore an excess of 66 which is to be compared with the modulus $35 \cdot 75 \; (= \sqrt{2556/2})$. There results the probability ·0045; which compounded with the result found for colour, viz., ·626, gives ·0028. And again this has to be compounded with the independent improbability shown by the *number of spots*, viz., ·127. The final outcome of the table is the small fraction ·00036; representing odds of nearly 3,000 to 1 against the fortuitous origination of the observed events.

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* For another way out of this difficulty see the present writer's article on the Calculus of Probability applied to Psychical Research in the *Proceedings of the Society for Psychical Research*, Vol. III. The logical varieties of the problem, according as it is or is not treated as *inverse* after the manner of Bayes, are distinguished in that article. In a subsequent article, Vol. IV, some mathematically peculiar cases are considered.

This result is consistent with, if not confirmed by, another set of statistics which Dr. Coover has furnished, namely, the record of guesses right as to all three particulars, number of spots, suit, and colour—right as to the "card" in his compendious phrase. The examination of this record after the manner of our Table I is not likely to afford much additional evidence. For rightness of "the "card" is compounded of two events, the rightness of the *suit* and that of the *number of spots*; and the separate examination (already performed) of those constituents is more searching than that of the compound.* The use of "the card" is also open to the objection that it requires peculiar caution. The probability of a right guess about "the card" being very small, namely, $\frac{1}{40}$ ($\frac{1}{4} \times \frac{1}{10}$), the received Bernouillian formulæ—the first approximation furnished by the normal law of error—is apt to be inaccurate, unless the number of observations handled is very large.

Dr. Coover has not entirely kept clear of this pitfall. But the general course of his reasoning is not prejudiced thereby. The same may be said about some other arguments which the mathematical purist might wish that he had expressed otherwise.†

His analytical reasoning is strongly confirmed by graphical exhibitions showing the correspondence between that distribution of the number of right guesses (as to *colour*, *suit*, &c.) which might be expected as the result of pure chance, and that which actually occurred. The manner in which the "histogram" (in Pearson's

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* For the reason that in the latter case we employ *only* the theory of error; whereas in the scrutiny of constituent parts we also employ the more elementary principle of probabilities which takes account of the fact that several portions of the record may show a bias in the same direction. See as to the relation of these two methods Section B of the present writer's paper on "Methods of Statistics" in the *Journal of the Royal Statistical Society, Jubilee Volume*, 1885. *Cp.* in that *Journal* for the same year Vol. XLVIII, Paper on "Variation in Rates," p. 632.

† He repeatedly applies rules derived from the Bernouillian formula to guesses about "the card" numbering fifty. Having properly laid down as the "limit of chance deviation," affording a "scientific standard of certainty" for general use, a deviation amounting to three times the modulus, he incautiously applies this general rule to the special case of fifty guesses about "the card." Thus in his Table XLI (p. 89) he describes as the "minimal significant deviation," from the most probable number, viz., 1·25 in a set of fifty experiments on the card, the deviation 4·685. But that deviation is not a "minimal significant" in any sense that signifies—not in the sense in which it is truly stated that in the case of *colour* a deviation of 30 per cent., that is 15, for a batch of 50 guesses is significant. In the case of "the card" there is nothing very extraordinary about the occurrence in question.

Again, in the context of his Table XLVIII (p. 106) he finds 1·31 as the "empirical standard deviation" for the number of right guesses as to "the card" in a batch of fifty guesses. But in the table it is implied that 1·31 is the standard deviation pertaining to *the mean* of a hundred such batches.

The "empirical" determination of the dispersion would have been more valuable (and would not have been much more troublesome if it had been useful phrase) representing the observed events hugs the curve traced by antecedent probability is very striking.

The conclusion is clenched by a series of experiments made by way of "control." Beside the guesses which, as above described, each reagent made as to a card envisaged by the agent, he also had to make some 50 guesses about cards not "imaged" by the agent, not examined by him till after the guess had been made. The agent would toss a die a hundred times; and according as an odd or even number turned up each time, he did or did not image the card, he conducted a "regular" or a "control" experiment. The results of the two experiments being exhibited side by side present no conspicuous contrast. But examined through the instrument of mathematical method, the "imaged" experiments show rather more evidence of causation other than chance. We have employed two tests.

First we have constructed a table, analogous to Table I, dealing with the "control" guesses as to colour, suit and number of spots, 4,865 of each kind.* Combining the figures for *colour* and *suit* in the manner above shown we find for the probability of the two observed events concurring, ·0181. This fraction is to be multiplied by ·47 the independent probability shown by the guesses about the *number of spots*. The final result, ·009, is sensibly larger than the corresponding figure for the "imaged" experiments, viz., ·00036. Yet it is perhaps more significant that the first figure should be so small than that the second figure should be still smaller. What if the explanation should prove to be the same for both phenomena, namely, the impossibility of realising ideal randomness, the tendency of law to recur however much we try to expel it by instruments of chance.†

A similar relation between the two kinds of experiment is presented by another test which Dr. Coover has applied. We subjoin

based on the actual observations relating to batches of *about* fifty, rather than on batches reduced—artificially pushed up or down—to fifty.

Again, in the use of the Pearsonian criterion for closeness of fit, Dr. Coover has not observed the sound rule, sanctioned by Pearson himself, that no compartment should be very small, should consist only of a single, or a very few observations. See *Journal of the Royal Statistical Society*, Vol. LXXVII (1914), p. 728. *Cp.* Pearson *Biometrika*, Vol. X, p. 85. But the more correct procedure (instanced below) does not make much difference in the result.

* See p. 223 above for explanation of the table.

† Professor Bowley has pointed out to me that the number of *odd* throws —dice turning up an odd number of spots—which Dr. Coover and his associates obtained in the course of 10,000 throws considerably exceeds the number that was to be expected as a result of pure chance. The excess was 135, 2·7 times the *standard deviation;* indicating odds of nearly 300 to 1 against the observed event occurring by chance.

Compare as to the limitations of Simple Sampling, Yule *Theory of Statistics* ch. xiv. s. 4.

here a specimen. Dr. Coover gives the following comparison between the observed numbers of right guesses about the card in each batch of 50 cards and the numbers which were to be expected on the supposition of pure chance.

Number of right guesses in batch of 50	*0*	*1*	*2*	*3*	*4*	*5*	*6*
Number expected in 100 batches, each of 50 guesses (m)	28	36	23	9	3	1	....
Number observed m'	24	32	30	8	4	1	1
$m-m'$ (e)	4	4	7	1	....	. .	....
e^2/m	·5714	·444	2·13	·077	....	....	....

$$\chi^2 = \Sigma \frac{e^2}{m} = 3\cdot2$$

To avoid dealing with very empty cells, we have lumped together into one compartment the frequencies pertaining to any number of right guesses greater than 2. For this outlying compartment the expected number being 13, the observed number was 14. The resulting value for χ^2, viz., 3·2, gives for the probability of the observed system of four differences having occurred by chance a quite substantial figure ·36. Treating similarly the corresponding record for the "imaged" experiments we find the smaller probability ·21.

There was found to be no great difference in the character of the results in those cases in which the reagent was specially confident that he had guessed rightly; nor yet according to the distance between the agent and the reagent, and other circumstances of which account was taken. Altogether the writer seems fairly well justified in his conclusion with respect to guesses about playing cards, "that no trace of an objective thought-transference is found either "as a capacity shared by our normal reagents in general, or as a "capacity enjoyed in perceptible measure by any of the individual "normal reagents."

We should explain that "normal" reagents are contrasted with "psychics," those who are reputed to be specially gifted with a power of telepathy or clairvoyance. The results of 1,000 experiments (about half "regular," and half "control") with ten psychics seem to differ in no essential respects from the results of the experiments with normal reagents.

The value of these conclusions and others *in pari materiâ* is heightened by a philosophical study on "Inductive Probability"; with which may be read the appendix on "Grounds of Scientific "Caution." Specially interesting is the collection of extraordinary coincidences, and the discussion of the "infinitesimal probability" which may attach to such experiences. In this connection we may refer to the author's rule with respect to methodical experiments such as he himself instituted, namely, that the probability with which we have to deal (*e.g.*, that of a right guess as to the colour, or as to "card") should not be less than ·025. This is certainly a good practical rule; regard being had to the mathematical difficulty of handling very small probabilities. But it must not be supposed that by adopting this rule for the premisses we can escape the philosophical difficulties attending the use of nearly infinitesimal probabilities.* Rather, it is the purpose of our logical methods to bring out such improbabilities as pertaining to hypotheses under examination—that of fortuitous origination, for instance, in the cases above considered.

We have by no means exhausted all the varied contributions which Dr. Coover—personally or by his assistants—makes to his large subject. But our interest in psychical research, apart from its statistical features, is moderate. It is not strong enough to carry us through a great many pages of unpleasantly close print. Referring only to those portions of the volume which we have read attentively, we record the opinion that Dr. Coover has not only applied the calculus of probabilities with considerable skill to test the hypothesis of thought-transference, but that also by collateral investigations he has verified the capacity of the calculus to act as a touchstone of hypotheses.

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* The following ἀπορία is suggested to us by the dictum of a noted psychical researcher quoted by Dr. Coover: "A few extraordinary "coincidences, though much more striking to the imagination, afford much "less reliable evidence of something beyond chance than a large number of "trivial ones all pointing in the same direction." Suppose it to have been shown that only by an extraordinary coincidence could an observed "devia-"tion" in the number of right guesses, say about the colour of a card, have occurred by chance. For instance, let the number of trials be 5,000, and, for the sake of illustration, suppose that the number of right guesses amounted to 2,650, presenting a deviation (from the most probable number, 2,500) of three times the modulus; such a number of right guesses may be expected to occur only once in a hundred thousand trials (as we reckon, above p. 223). Would such an excess (taken by itself, without examination of constituent batches) afford "much less reliable evidence of something beyond chance" than a large number of trivial coincidences which arithmetically constituted the same probability? Thus let the data consist of 16 or 17 successive guesses (about the colour), all right. This series yields much the same mathematical probability as the single datum of one huge deviation before considered. Ought the mere fact of observed repetition to exercise a certain additional inductive force?

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*Labour and Industry in Australia.* By T. A. Coghlan. (In four volumes.). viii + 2,449 pp., 8vo. Oxford: The University Press. 1918. Price 3*l.* 13*s.* 6*d.*

Among treatises which the description of a "*magnum opus*" fits few, if any, could have earned more fully the high compliment than this authoritative new book. The epithet, we may say, is "literally" appropriate to four big volumes of nearly 2,500 pages; and the "letter" finds abundant confirmation in the "spirit" of this careful history of the large continent concerned during the century between the first settlement in 1788 and the realisation of the Commonwealth in 1901. Seven Parts, with eight to twelve chapters in each, carry us through successive periods. From the original start in Botany Bay as a "penal receptacle" we are taken to the "crossing of the mountains" by explorers into the interior; and from abolition of the "assignment" system of convict labour we arrive at the discovery of gold. That was an event of determining importance. It brought a "revolutionary change in the "relations between employers and employed"; it caused the removal of the "last vestiges of convictism": and, "industrially," it was the "new creation of Australia." It was indeed a climax. We then move on from the introduction of the principle of "free "selection of land before survey" to the "establishment of pro-"tection in Victoria and the beginning of a vigorous policy of public "works in all the colonies." This led, mainly through easy borrowing at home for outlay, like land-speculation, in which investment was not "liquid," to the financial crisis of 1893. That incident, in its turn, can be regarded as an anti-climax. And, lastly, in the concluding seventh part, we are brought from that shaking, sobering ordeal to the commencement of a new *régime*, in which the separated communities finally found, with the opening year of the twentieth century, union through federation.

The scope, thus indicated, of Sir Timothy Coghlan's studies is wider than the statement on the title-page or the confession in his Preface might suggest. For his account of "labour and industry" is not confined to the exhaustive record of such questions as wages and working-hours, convict and free and coloured labour, agricultural and pastoral pursuits, immigration, factory and shop legislation, strikes and the settlement of industrial disputes, and the formation and development of a political "labour party"; but explicit reference is also made to topics, like currency, banking and exchange, land policy and legislation, prices, trade and finance, tariff changes and international fiscal relations. To some of these various affairs, as trade and prices, chapters are assigned in each period as regularly as they are given to labour and wages; but over and above such discussion, generally recurring, particular problems or singular incidents, which attracted notice at the time when they came before Australian statesmen or the public, receive, in their place, detailed consideration. Distinct chapters, for instance, which enhance the interest of the main narrative, and do not disturb its course, are devoted to the "genesis of the wool-industry," to "railway "beginnings,' to the "recrudescence of bushranging," to the "introduction of coloured labour into Queensland," to the "exclu- "sion of the Chinese," to the "maritime strike of 1890," and to the "financial crises of 1841, 1842 and 1843, as well as the crash of 1893": and the famous, if unlucky, Wakefield theory of colonisation fills a prominent position in a chapter in the early part of the tale.

Sir Timothy Coghlan's "great work" indeed is, as we think, more than an economic history. Because, as he shows plainly, the fortunes of labour and the course of industry are bound to the conditions of trade, and have been, for good or ill, affected by currency arrangements, banking systems and tariff policies; satisfactory handling of the former cannot be achieved without knowledge of the latter. But it is no less true, and equally pertinent, to point out that the political and economic histories of peoples are intertwined: and, as the general historian of all civilised countries is compelled, when he reaches modern times, to use an increasing quantity of economic matter in his accounts of men and records of affairs, so *en revanche* a colonial economist, examining Australia in the nineteenth century, must take notice of the acts and motives of the politicians, who could not, if they wished, avoid influencing, as they were influenced by, the behaviour and concerns of the bulk of their constituents in the sphere of trade and industry. In these four volumes we find much that we should expect to meet in a political history of the country; and Sir Timothy has, we think, travelled further in that direction than he contemplates or essayed. In our judgment his book is not a "history of Labour" alone, though it deals especially, outside that range, with the "things most "nearly affecting the Labour Movement in Australia." That, however, is in fact a big area, as the size of the four volumes proves. We offer sincere congratulation on the success of a vast enterprise. It has, we are sure, superseded previous surveys attempted by others of portions of the immense ground now covered; and a work, which must have been, in no ordinary sense, a "labour "of love," will, we think, be consulted with advantage constantly during future years by those who want to know how Australia came to be the great Over-seas Dominion she had become by the close of the last century. Her men and their manners, policies and institutions, hopes and achievements, failures and successes, are laid skilfully under contribution to complete a vivid picture.

The length and range of this history make the task of the reviewer by no means easy. In any notice he may undertake he must select and will perforce omit. If we have a personal complaint to offer it is that the help obtained from the full index at the end might have been increased by a running marginal analysis on the separate pages or by summaries of contents prefixed to each chapter. But, if such changes are found feasible, or thought desirable, in fresh editions of what we are tolerably confident must take the honourable place of an established book of reference, we would also suggest the inclusion in the text or the addition in appendices of tables of figures. With a laudable wish, it may have been, not to break the interest of lay readers in the smooth flow of the agreeable narrative, not merely are foot-notes avoided, stating the "official records," the "contemporary newspapers" and the "other publications," which have supplemented the "information obtained direct from many "persons who played a prominent part in Australian affairs from "1880 onwards," but what can be regarded as too sparing a recourse has been had to formal statistics. Our author tells us that he is his "own authority" for those supplied, "as also for the account "of the banking crisis of 1893" "and for some phases of the "Labour movement." This account, we may note, seems to us of peculiar interest and value. But we would urge that the capacity shown and experience gained in what has been, so to say, Sir Timothy's life-long profession might have been employed appropriately more often in this book. It might have been used to clinch the moral pointed or corroborate the facts advanced. Such numerical data are now, as we judge, more conspicuous by their strange absence than by welcome presence; and we regret the severe restraint thus placed apparently upon the exhibition of a special aptitude by an acknowledged master. But we hasten to say that he has contrived with great skill and marked success to render clear and lively, as well as full and accurate, a tale which in less dexterous, heavier hands might have become a dry chronological record or seemed a bewildering compilation of an arid mass of disconnected facts; and he may know better than we can pretend to do how fine is the severance of what is readable and will please from what would tire or repel the majority of those to whom he has addressed his book.

Of the fascination of his long full story, as he tells it, we can have no doubt; and our trouble here is to choose the most effective mode of conveying that impression. We have already tried by reference to the titles of the separate parts to show the broad lines along which the "history of Australia" has been traced; and we will now attempt to supply some of the prominent detail of that development. It had not, we may recall, a happy start. To "meet the "necessity of finding a suitable place for the reception of British "criminals" was no lofty aim for the mother-country or the colony thus victimised; and the interests of the two collided from the outset. Transportation neither in its crude early shape nor with the improvements designed later could produce likely or welcome colonists; and a mixture of independent settlers with forced prisoners had little or nothing to recommend it, and was not originally contemplated by the Home Government. Successive stages of "probation," through which criminals for more or less heinous offences should be passed on the road to liberty, as time elapsed and conduct was improved, were an "after-thought," devised with some little pains; but we cannot wonder that a stout protest was raised in Australia against the incursion of the system through "side-doors" when it had been stopped at the "front-entrance," or that difficulties appeared at first and lasted throughout in the treatment of "assigned" convict-labour, first by the military garrison and then by others, while "emancipists" who had got their freedom formed an unsatisfactory class whose wealth, if it was not small, was often dubiously acquired. The "ticket-of-leave" men, maintaining themselves by their own exertions, occupied an intermediate place. But it was only by degrees that emigration, more properly regarded, thrust aside the original plan in the outlook of English statesmen; and the "great gold discoveries," which "precipitated Australia into a nation," wrought the eventful change from a "dependent penal settlement" to a "free self-governing colony," although for some while before 1851 the struggle against autocratic government from home had been proceeding, and in 1840 transportation to New South Wales at least was abolished.

Sir Timothy gives a graphic account of the gold-finds and their large consequences. As he truly says, "profound economic and "political changes" marked the ten years stretching from 1851 to 1861; and, if they were not "directly produced," they were "greatly hastened," by the rich discoveries of the yellow metal. The "method of Government," "completely altered," was "placed "on a democratic basis," the "land question" was "reopened in "the interests of genuine settlers," doomed otherwise to be "shut "out" by a "virtual monopoly" secured before by the "squatters," the "last vestiges of convictism" were destroyed, and the "relations "between employer and employed" underwent "revolutionary" improvement. So potent were the forces set in motion, or so decisive was the acceleration caused, by this single factor; and, with all the ill that might be traced to feverish excitement or the speculative passion, or to the voluntary influx of some among the crowd of immigrants scarcely more desirable than convicts whose arrival had been forced before, the balance was preponderantly good. A " doubling " of population of the continent as a whole within five years, and a fivefold increase in Victoria alone, a " com-" plete dislocation " of " all " other " industries," a " remarkable " inflation of prices," and noticeable effects, differing in kind and degree in the different colonies, on public revenue and expenditure, were some of the results, welcome or the reverse, immediately or soon achieved. The following period was quieter, and the " rapid " changes of fortune," the " inrush of population " and the " wide " extension of the franchise " of the preceding " revolution " paved the way for the " gradual and somewhat timid appearance of " democracy " between 1862 and 1873.

In the twenty years that followed fifteen of " prosperity " and " expansion of industry and commerce " were attended by five of " violent disturbance social and economic." An " orgy of specula-" tion in land, mines and properties of all kinds " " did much to " promote discontent and unrest among the industrial classes " and " led directly to the great financial crisis of 1893." Yet Sir Timothy proves that the " spirited policy " of public works was directly beneficial, and might justly be thought necessary to an effective entry on a permanent advance. He argues persuasively that the payment of members did not, as it was alleged, produce the original appearance of the labour party in Colonial politics, and that industrial disturbance afterwards was not responsible for the withdrawal in alarm of British credit from the financial institutions of Australia. It was the previous " unsound condition of " business " that justified the panic of 1893, and the " labour " disputes " and " social unrest " were symptoms rather than the cause of a " general " " disease " " afflicting " " industrial and " financial life." There was certainly lavish expenditure by Governments as there was extravagant speculation of private individuals, and both were helped by loans too easily obtained on an excessive scale in Britain. The money thus got by the former was not indeed wasted, when spent largely upon railways ; but, like that procured by the latter and invested in the purchase and development of land, it was " locked up " for the time and was " not liquid." This, however, though contrary to British practice, suited Australian banks with their larger reserves and their deposits withdrawable after longer notice. The " tightness," when the crisis came, was chiefly due to the circumstance that the British deposits, though they had been advanced for considerable periods, were repayable in London, and would not therefore be transferred to other banks in Australia itself, replacing promptly the funds on which the drain was felt. But the crisis had its good permanent results if the immediate stress was painful or disastrous. It led to wise caution in borrowers and lenders ; and credit rested henceforth on a more secure and broad basis.

The treatment of the whole episode, which we owe, as we have noted, to Sir Timothy himself, is luminous; and no less instructive is the fresh account supplied of the origin and growth of the Labour Party. The support, which it derived from those who were not themselves working-men, and cross-divisions, cutting athwart political combinations through differences on fiscal policy, are important points; but of even greater interest is the emphasis placed on the constancy with which the Australian organised workmen followed the movements of Labour in England and on the probable influence they exerted in promoting Federation in Australia. At first the weapon of the strike was the favourite instrument used, and it caused notorious conflicts of much violence like the maritime strike of 1890, to which a whole chapter is devoted, and then "political "action" was chosen in preference. And with the recognition throughout Australia of the common aims and interests of working-men the Labour politicians and their followers were drawn more closely together from the different colonies than the leaders or adherents of the other parties or the members of the remaining classes. Thus the Commonwealth, with the establishment of which in 1901 Sir Timothy ends his tale, was, he suggests, brought definitely within the sphere of "practical politics."

In the brief summary of the big narrative we have attempted to supply we have omitted much, and may have done injustice to its full attractiveness. We must in conclusion refer our readers to the four volumes themselves if they would properly appreciate the portraits of such politicians—to mention two alone of many—as Parkes or Reid, or of labour-leaders like Lane, or of Macarthur, the creator of the woollen-industry. They must give themselves this pleasure if they would admire, as they should, the lucidity with which the curious twists and turns taken in such matters as land-settlement and immigration are explained, or the failure in Wakefield's plan of colonisation as applied to practice in Australia demonstrated. Everywhere they will be impressed by the grip of facts and the mastery of guiding principles and moving forces, and by the scrupulous fairness shown in their description and interpretation. We end, as we began, with our belief that this book will be cordially recognised for the "great work" it is. It is a monument of industry and of ability, and Englishmen like Australians will obtain much recreation and instruction from its agreeable but careful pages.

L.L.P.

2.—*Parliament and the Taxpayer.* By E. H. Davenport. With an introduction by the Rt. Hon. Herbert Samuel. xvi + 256 pp., 8vo. London: Skeffington and Son, Ltd. 1919. Price 6*s.* net.

Recent works on our Financial System have been concerned chiefly with the adequacy of formal procedure and the constitutional technique of accurate accounting, with occasional suggestions for improvements in the presentation of estimates and financial statements. The present volume deals with Parliamentary control of expenditure, and the ability of the legislature to criticise intelligently the extent and character of expenditure in relation to the object of that expenditure. The author rightly remarks that there is a real gap in our literature, for the historian has written for the Exchequer from its origin to the present Treasury, or Executive Control, and in so far as Parliamentary control has been discussed it has been control of *taxation* or raising money rather than spending it. The political scientist has not treated the problem from the House of Commons end at all. The problem of proper outside control of departmental expenditure has become most acute during the war, and Mr. Davenport makes a real and very successful attempt to fill the gap, for, in Mr. Samuels' words, he has furnished "a concise survey of the "rise, and the ebb and the rise again, of Parliamentary control "over expenditure through the centuries of our Constitution, and "an accurate account of the origin and nature of the efforts now "being made to make that control a more effective protection of the "interest of the taxpayer." Perhaps much need not be said in a Journal of this character upon the very interesting historical analysis, nor even upon the many criticisms of the present-day Parliamentary machinery which hinder rather than aid Parliamentary control. The author's qualifications as an historical student and as Secretary to the War Office Sub-Committee to the Select Committee on National Expenditure have fitted him well for the task. Rather must particular reference be made to that part of his work which deals with the form in which estimates and accounts are presented. This is nothing less than an urgent plea for a vast extension of statistical methods and principles over the whole field of Government expenditure. When the author pleads most skilfully that the presentation of estimates divided under the *things bought*, which are brought to manifold uses, helps no one in intelligent criticism, and that what is really wanted is a division according to things or services produced so that the net cost of each *object* of the expenditure rather than each subject of expenditure may be seen, he is really asking for an elaborate system of cost accounting and efficiency statistics. Thus his model form of estimate (under the Army) would show: "*Hospital*—7,000 beds at average daily cost of 6*s.* 6*d.* per day "occupied bed, including 400,000 for R.A.M.C. personnel, 830,375*l.*," instead of splitting up the cost of hospitals under a score of headings such as "Working Expenses," "Stores," "Works and Buildings." He also makes reference to the possibilities of unit costing in the Post Office, and appears to be unaware of what is already done in that department (as described in Dr. Smith's work on Postal Rates). Indeed, it is probable that many offices possess some kind of comparative efficiency statistics which are adequate for their departmental purpose, in the hands of trained men who understand them, but which would need every kind of qualification and explanation before they could stand the strain of criticism by uninstructed persons, however intelligent. Anyone who has tried *comparative* costing—not comparative in the sense of comparability with itself at intervals of time, but in the sense of true comparability between different establishments or systems at the same time—knows that, while direct costs are not difficult to ascertain, the true problem, sometimes not strictly capable of solution at all, is the allocation and exhaustion of "oncost." This may often be done quite legitimately in a dozen different ways. Mr. Davenport shows little appreciation of the fact that the present-day position even of commercial costing is empirical, that there is no science agreed in an absolute sense, and that the problem for oncost in a Government department, though not more complex, is if anything, more debatable than in manufacture. The essence of the criticism which it is desired to facilitate is, of course, comparison, and that comparison must necessarily be with outside standards, viz., the equivalent costs of similar services in the commercial world, or it is meaningless. But although we may agree with Mr. Davenport's main contentions, it is impossible to avoid the feeling that the new area of discussion that will be opened may ultimately fail of its object, for it will prove the most fruitful field for mare's nests that the House of Commons has ever revelled in, far exceeding in scope for the mob instinct the Committee stage of a Finance Bill. For the member has to discover that the Government costing per unit includes no rates or duties, probably no rent, possibly a fraction of a Cabinet minister, occasionally an audit fee, and many overhead charges necessarily peculiar to a Government office, while the commercial costing for a similar unit may have transport charged on a commercial and not a cost basis, and fluctuations in the new material that the Government avoids. We are far from asserting that something cannot properly be done in the direction indicated, but it is well to recognize that *this* class of comparative statistics may mean turning the House of Commons from a shorn Samson, in the matter of financial criticism, to an inhabitant of Laputa. J.C.S.

3.—*Public Administration in the Highlands and Islands of Scotland.* By John Percival Day, B.A., B.Sc., D.Phil. viii + 407 pp., 8vo. University of London Press, Limited, 1918. Price 25*s.* net.

The Highlands and islands of Scotland are well described by Dr. Day as "one of the marginal areas of the United Kingdom." He states that a system of administration, devised by the middle classes for the towns of England, has been successively stretched to cover the needs of the rural districts of England and of Lowland Scotland, and again to cover those of the Highlands and islands, where the middle classes and the towns do not exist. He shows the result in costliness and inefficiency.

The area with which his book deals covers nearly half Scotland in extent, and consists of the seven crofting counties, Argyll, Caithness, Inverness, Orkneys, Ross and Cromarty, Shetland and Sutherland. The people were studied by the late Rev. John Gregorson Campbell, who was minister of Tiree from 1861 to 1891, and left at his death a considerable collection of manuscripts, derived from oral sources, relating to their superstitions, and their belief in witchcraft and second sight, which have been published in two volumes by MacLehose and Sons, of Glasgow.

The archæology and topography of the island of North Uist have been dealt with exhaustively in a well-illustrated work by Dr. Erskine Beveridge, published by William Brown, of Edinburgh. If, therefore, we accepted the opinion of Knox, the anatomist, that "race is "everything in human affairs," we should not be without materials for the study of the country in question from that point of view. Dr. Day's work is limited to the subject of the public administration of the highlands and islands and to the history of State legislation for that object. That, in itself, justifies an extended treatment of the question. What are the proper functions of the State and what are the proper limits of State action in relation to a portion of the population existing in a marginal area under different conditions from the bulk of the population in the less remote parts of the United Kingdom, are problems which call for full consideration and for careful study in the light of all the information that can be gained as to their economic condition as well as their racial and historic specialities.

The population of the seven crofting counties has sensibly diminished since the middle of the last century, while that of Scotland as a whole has steadily increased. Dr. Day furnishes a number of statistical and geographical diagrams illustrating these facts. During the same period the deer forests have been extended at the expense of the sheep farms. Of the much-discussed evictions which followed the failure of the potato fields, Dr. Day gives a short account of that at Sollas, in North Uist, and agrees with Dr. Beveridge in vindicating the character of the landlords. The tenacious attachment of the people to their homes gave the proceedings an appearance of cruelty, but the destitution was so widespread and the charitable relief so inadequate that emigration appeared to be the only remedy. In the case of Sollas, Lord Macdonald, the proprietor, was well known as an unselfish and generous landlord, who had greatly embarrassed himself by his expenditure in the interest of his tenants.

Dr. Day's work deals only with the circumstances before the outbreak of war in 1914, partly because statistics of a later date are not yet available, and partly because the war has caused deviations in the statistical curves of events that will for some time to come have perplexing results. Indeed, he states that the book was nearly complete in 1914. The conclusion was written on his return from France.

Materials for his study have been afforded by a bewildering series of Commissions and other inquiries into the condition of the people, the parent of which was the Royal Commission of 1883 to inquire into the condition of the crofters and cottars in the Highlands and Islands of Scotland, upon which the Crofters' Holdings Act of 1886 was based and the Land Court established. Dr. Day has done good service by stating in a manner which appears to us to be at once clear and judicious the facts which were ascertained by these various bodies and the effect of the several legislative measures which were adopted upon their recommendations.

Dr. Day's conclusions are that the present system of public administration in the Highlands and islands, not having been designed with any reference to or consideration of the particular economic, social or physical condition of the people, is too elaborate, deficient, confused and costly. The number of local authorities is excessive, and the supply of candidates for them is insufficient; failures have been met not by the reorganisation of existing authorities, but by the creation of new governing bodies; temporary expedients have been adopted to meet difficulties; and the cost has been enormous, having regard to the poverty of the country. While, therefore, the present system of public administration may be excellent for Lowland Scotland, and tolerable even for the main Highlands, Dr. Day thinks it is not tolerable for the Orkneys, Shetlands, the Long Island or Skye. In 1914, rates were higher than they had ever been, and were increasing; the crofters would not purchase their holdings, and State purchase had not been a success. He recommends that the whole structure of local government should be overhauled and simplified; that migration or emigration under the most generous conditions and State direction should be adopted as the only remedy; and urges that no better time than the present could be found for applying it.

Dr. Day's criticism and his recommendations deserve the earnest attention of the Legislature, which may still have the opportunity of correcting past mistakes, and placing an industrious and deserving portion of the community in a position to obtain a livelihood among less rigorous surroundings than those in which they are unhappily now placed. E.B.

4.—*Money: Its Connection with Rising and Falling Prices.* By Edwin Cannan, M.A., LL.D., Professor of Political Economy in the University of London. 66 pp., 8vo. London. P. S. King and Son, Ltd. 1918. Price *2s. 6d.*

This unpretentious little volume contains more concentrated wisdom than most books ten times its size or price. Professor Cannan was moved to write an additional chapter for his deservedly popular volume on "Wealth," to deal with the pressing problem of the moment, and very naturally found the subject grow under his hand and merit separate publication. Anyone who has tried a popular exposition of the subject, either in writing, or lecturing, or arguing in the train, will readily concede that, with the possible exception of the foreign exchanges, it is one of the most difficult branches of economics to get home upon in its fundamental features. There is probably no better explanation than this little work. But it is somewhat "stiffer" reading than "Wealth," and there is no doubt that it is considerably more than an account of received economic teaching, for it brings forward new facts, and, towards the end, some very trenchant observations on the present currency position. It is probable that, with all the clarity of Dr. Cannan's treatment, the "ordinary" reader will still fail to grasp the *reason* for the relation between currency issues and prices, though he will accept the statement. For example, at one critical point it says:—"A great part of almost every issue, and sometimes the "whole of it, goes to increase the aggregate amount of money which "people and Government together can and do spend on things and "services. The notes are exchanged for something: the issuers buy "things and services with them, or lend or give them to others "who do. They may, if a Government, go through the farce of "giving them in exchange for other money lent to them and then "spending them directly, but however the process may be disguised "it results in more money to spend and more money spent. *The "perfectly natural consequence is a rise of prices.*" We have found that the person approaching this subject for the first time does not see the "consequence," and fails to realise that a magic doubling the currency notes in everyone's pocket would have any effect—he just thinks things would cost the same, and the additional notes stay in the pockets. The competition of the total currency for the total goods is a difficult idea to assimilate.

If Dr. Cannan's book is as near the ideal as possible for the average reader, it is at the same time a word of wisdom for the "statesman," and a piece of fresh reading for the economist, for which all three should be grateful. The concluding pages, dealing with "the most insidious and dangerous of all the arguments in "favour of increasing issues," viz., that "the issuers have no control "over the issue and that it is automatic, in response to a genuine "demand and not forced on people," is the best piece of criticism on the subject that we have seen. Perhaps Professor Cannan, like other critics of the present currency position, fails to do justice to the effects of inflation in providing an artificial psychological stimulus to effort and production during the war which an "all-loan-and-taxation" policy could not have given. The most ardent critic of the total effect of alcohol upon the human system and its aggregate energy may acknowledge that the rum ration at the right moment before going "over the top" made possible physical feats during the *critical period* that might otherwise never have been forthcoming.

J.C.S.

5.—*Labour in the Commonwealth.* By G. D. H. Cole. 223 pp. 12mo. London: Headley Brothers, 1918. Price 5*s.* 6*d.*

An Introduction to Trade Unionism. By G. D. H. Cole. vi + 128 pp., 8vo. London: George Allen and Unwin, 1918. Price 5*s.*

The Payment of Wages. By G. D. H. Cole. vi + 155 pp., 8vo. London: George Allen and Unwin, 1918. Price 6*s.*

In a long grim struggle we and our Allies have won decisive victory. At home, meantime, the smaller polemic of party politics had yielded happily to larger sympathy with national concern. But scarcely had the battle closed, and peace was not guaranteed, when this harmony was broken by the re-entry in the industrial area of self-regarding faction. That spirit in the past was the prelude and accompaniment, though, we may hope, in a future brighter than any conceived by Mr. Cole, it will be only a retreating echo, of "unrest." A reassuring explanation was indeed at once forthcoming in frayed nerves suddenly relieved from wearing strain. But less welcome was the stress laid on the desire to use before it went an opportunity for a good bargain on the shorter hours of work, and higher rates of wages, compared with those of bygone days, for which "Labour" was resolved henceforth to take its place in the "Commonwealth" The relation and behaviour, actual and desired, of the two to one another form the general subject of the books before us which may therefore fitly be considered as they bear upon the present situation.

That aspect, frankly, is not pleasing. Most of us had hoped that in the end the sane sense and equitable feeling, and the English liking for a satisfying compromise of "give and take," of our employers and of the leaders of our workmen would overcome in practice perils which ought not, we felt, to be more formidable when wisely met than when faced unitedly in the tremendous ordeal of the war. But we are compelled to say that professional statesmen, who should mediate in such disputes, and the lay opinion of the public, which by its emphatic verdict can turn the balance wavering between strife and reconciliation, could not get from our author the timely help of moderate advice they might expect from an informed impartial student. On the contrary, provocation or obstruction would be more apparent in the theories advanced and counsel pressed by him.

Nimble dialectic, rare natural ability, and wide and close acquaintance shown in the last two of the three volumes with relevant industrial data, like trade union "structure," "government" and "problems," and the elastic detail of various particular modes of "payment of wages" "by results" are used, infelicitously as we think, to support the violent programme recommended in the first book to the "younger generation." The lines on the back of its title page, stating that "all things that have been great out of destruction grew," announce defiantly the revolutionary spirit which Mr. Cole affects. It may. as he sees, be not very decent to affirm that in the world-wide contest just concluded "beneath the unity "of every one of the contending Commonwealths" was "the "smouldering reality of the class struggle"; and his tongue, we can imagine, is sometimes sardonically moving in his cheek when he is "exasperating" "worthy people" by flippant paradox or perverse mis tatement. But there is an ominous significance in the hour chosen forthis outburst of venomous discontent with the existing economic order. Almost simultaneously with the victorious finish of military and naval effort, which had called a truce, if it had not given final dismissal, to those "sordid antagonisms" on which his complacent gaze is fixed, the "trilogy" was published.

During the war some petulant chagrin had been shown by him at the breach opened thereby in the international solidarity of Labour; and for his part in former books he assiduously instigated British workmen to assert growing claims, however incongruous with the pressing interests of the country, against British employers, who, as their permanent foes, he urged, were trying, by means more foul than fair, to take advantage. And then, as returning peace between nations on the terms secured bid fair to gratify our patriotic better feelings, a chance appeared for him to play again with more effect the congenial rôle of delighted witness, or active fomenter, of class-war. It is not unfair to treat the suggestions and avowals now before us as we might regard the hoarse or harsh refrain of the greedy cries of some bird of prey resuming sight of an interrupted meal. A "gospel of hate," not less poisonous than that lately mouthed by Germans against England, seems to stimulate Mr. Cole to coarse irrational abuse of the personnel and furniture of our present industrial establishments. And the more polished and reasoned philosophy with which he condescendingly supplies the rough prejudice and crude conceptions of his ignorant friends is marred by sneers. His wit indeed is more brutal than it is delicate, and the flavour tart rather than demulcent.

This, however, is most conspicuous where propaganda, and not analysis, is attempted, and is specially characteristic of the first book on our list. Yet a moral, tainted with similar infection, lies beneath the valuable descriptions of the other two volumes. We recognize their merits. They are accounts, brought down to date, of material contained in treatises of such repute as Mr. and Mrs. Webb's "standard works" on the "*History of Trade Unionism*" and "*Industrial Democracy,*" and in the comprehensive survey of "*Methods of Industrial Remuneration*" which we owe to David Schloss. For a clear compact conspectus of the present organizations and existing or projected modes of payment of wage-earners, for keen criticism of boasted merits and alleged defects in policies and systems, for the masterly disentanglement of intricate complexity, this later exponent can invite comparison with his predecessors; and the more modest size of the new inquiries is no true index of their relative importance. Mr. Cole writes of his study of trade unionism as a "short" "introduction," but it casts penetrating light into dark recesses. He is, on the other hand, fully justified in claiming that his scrutiny of wage-payments fills a gap. That object is achieved because after Schloss no one had produced a "general" book upon the subject, which, without even that exception, had not hitherto been approached "from the trade union point of view."

This acknowledged attitude may impair impartiality observed more strictly by the earlier authority. But, decidedly hostile, for instance, as is the handling of the new advertised specific of "scientific management," to which perhaps a disproportionate space is given, the grave objections urged should not be thrust aside as obviously prejudiced. In effect Mr. Cole maintains that its complimentary epithet has not been earned by such contrivance, which is nevertheless justly suspect because it views human beings as automata or machines. It must however be remembered that he starts with a resolve to pronounce impossible all improvement of the wage-relation, and he would deprecate, and stop, honest attempts to "mend" what, so far as he can secure, should speedily, and forcibly, be "ended." In that sense he is a "detached" observer, but he is no neutral judge. Yet his inspection of "various piece-work "systems," of "bonus systems" in general and the "premium "bonus system" in particular, of "price-lists," "commission "systems" and "profit-sharing," has been well planned and is brilliantly performed. From this ordered mass of evidence however we reach a conclusion opposite to his. The adaptability of wage-payment to a host of varying patterns, which he proves, makes it less, not more, easy to accept his general imputation of "slavery" to wage-receiving, or to acquiesce in the prophecy that so flexible a tie will not endure.

Nor does Mr. Cole's lively review of what we should term the "fissiparous" tendencies of Trade Unions corroborate the main inference of his second book. The numerous divisions and cross-divisions, barring final classification, are emphasized. Notable differences of "structure," it is seen, are not limited to the opposition, vital as that is thought, of "crafts" to "industries"; but on similar, though not identical, lines of clashing entanglement work, rank and feeling are shown to sever "skilled" from "un-"skilled" labour, and the contrast is no less marked of high regular contributions, to provide, with due responsibility attaching, for a host of friendly-society benefits, and funds, supported by no steady accumulation of reserves, destined for free expenditure on short, sharp fights, and raised hastily in low subscriptions from a wide loose clientêle. Varieties of "government," again, are awkward but persistent obstacles to uniformity, sometimes exalting the "executive council" or the "general secretary," and sometimes subordinating their acts to bodies of "delegates" frequently summoned, or to an immediate "mandate" given directly on each critical occasion by the local "lodges." And, lastly, "family quarrels," so to say, about "demarcation" and the like do not fit into the hypothesis of one inevitable trend on which Trade Unionism steadily progresses in the direction wished by him.

For Mr. Cole's panacea is "Guild Socialism." National Guilds however are obviously a "compromise," which bystanders may regard as "halting," between the demands of the new Syndicalism and the claims of the old State Socialists. If what is left of the second to safeguard the public interests of consumers can be reconciled with the complete control dictated in the first of production by the workmen engaged upon the particular class of work concerned, Mr. Cole's "makeshift" may satisfy. It is a *via media* between extremes; and "demarcation" may prove here also a provoking cause of controversy. We should not have ventured to presume that such an ideal would find sure lodging in so positive a mind; nor do we dare to predict that this balanced equipoise will long retain the enthusiasm of his companions. But for the time at least our author represents omens like the rise to power of "shop-stewards," begetting, it is true, constant friction with employers, and fanning smouldering discontent or blazing disagreement of the rank and file with the less aggressive state-craft of the higher experienced union officials, as sure auspicious signs of a common inclination to take his remedy. We may distrust its healing power as we would that of some purgative; for the "class-struggle" needed for the temporary occupation of this "half-way-house" is not welcome, even if it become, by Mr. Cole's ironical leave, as "orderly as a prayer-meeting." But, when we have allowed for distortion due to the "imaginings" of the narrator, we can appreciate, and use, the fresh information of his lucid story.

From the exposé of trade unionism and the scrutiny of "payment by results under the wage-system," prepared for the "Fabian Research Department," we turn again to the book intended "for the younger generation." In this essay Mr. Cole's "inner "self" is revealed, though he does not disown a personal responsibility for opinions given in the others. But the "preacher," we may suppose, gladly throws aside here restraints to which the "researcher" may elsewhere have reluctantly or necessarily submitted. Here, too, however some cool convincing reasoning is mixed with heated abuse and bold rhetoric. Mr. Cole's complaint indeed of the "abstraction" used by others does not save him from the same defect. He may be right in arguing that the "State" is not "an absolute or universally sovereign authority," but "merely "a functional expression among other functional expressions of "the common will of the men and women who compose the Commonwealth." And thus it may be implied that we should speak of commonwealths in the concrete plural rather than employ the singular number. But his application of the other term brought into close connection remains "abstract," and is unreal. For, while the "Labour," whose cause he champions, may now be seeking astutely to combine the interest and strength of professional brain-workers, and even of supervising foremen, with those of artisans and the "unskilled," it, and he, neglect, or exclude, in defiant omission or unconscious fallacy, capitalist employers. Yet their duties are really as arduous, and their activity is no less necessary. They are often "workers"; and "Labour" without them is no more than an abstraction.

Mr. Cole vilifies friends as well as foes. It is not only the politicians of the ordinary parties who are made to feel the smart of his biting satire; but trade union leaders are told in patronising scorn that they "lack" "ideas" and "constructive imagination," and their followers are grimly reproached or chid savagely for being "conservatively" "phlegmatic." On his sarcastic view the Fabians occupy one wing of a movement for reform, hopelessly tame and stupid, on the other wing of which the Charity Organization Society is discovered; and so expert a Professor of Public Administration and ambitious a socialistic schemer as Mr. Webb is arrogantly charged with blundering misstatement. Mr. Cole, moreover, we note, is quick to discern and prompt to acknowledge that it is not the "idle" so much as the "busy" rich, the "lean" rather than the "fat" men, who are formidable; and with refreshing, if unkindly, candour he allows that, as the "proletarian outlook" is not likely, through imperfect education, to be otherwise than "narrow," one "half-truth" may be substituted by them for another formerly fathered by the limited bourgeoisie But the recognition of the true circumstances that "crafty" capitalists are constantly "picking" for promotion the more able individuals from the working-classes, and that "skilled" labour is prone to handle roughly the "unskilled," as they are the "bottom "dog," conflicts with the audacious dogmas, nursed and pressed throughout, that wage-earners are doomed to be "servile" and that "humanity" requires the overthrow of "capital" by "labour." The riddle is not brought nearer to solution by the correct admission that the "workers in the Labour Movement are not entirely pro-"pertyless."

Thus however does Mr. Cole's agile mind, in its cynical mood, escape from the appropriate obligations of his hampering creed, if consistency is damaged in the process. He is no "blind leader of "the blind"; and his guidance is more to be feared on that account. His concessions can deceive and his reasoning eludes, but his destructive aim persists. The revolutionary attitude may be a pose slimly assumed; but could serious reformers, moderate or even progressive, keep company with one who seems to find pleasure in saying that "the whole damned order of things hangs "together" "in a servile society" "where it would be absurd to "look for free art and free amusement," and offers this nasty caricature for a description of the England of the present hour? If it were gravely put forward it would be glaringly inaccurate: if it be recklessly advanced as a fancy sketch to gratify an idle whim the irresponsible levity by which the vulgar flout is prompted is purely mischievous. We do not envy Mr. Cole his choice of either horn of the dilemma. But it is a pity that at this juncture an author of his parts and temper, with such ability and such caprice, should command a hearing from the officials or the public of the Labour World. Some may be dazzled by the daring attitude he strikes or by the smart cynicism of his comments, if they cannot understand, or use, the flexible apparatus of supple dialectic placed at their disposal and designed for their education. Others are likely to be confirmed in old prejudice or encouraged to new appetites by his example and his precept. Their belief and conduct may seem more plausible and less crude when garbed with logic and equipped with erudition. Disgruntled scholars have before now sought prominence in *émeutes*, and the academic atmosphere, removing from sobering contact with prosaic affairs, seems favourable to the "constructive imagination" of those grandiose dreams which lead plain men to social chaos. That is, we think, what Mr. Cole, in impish glee, intends by the "very great mess alike of the art of "government and of the arts of production and service" that the world "set free from capitalism to-morrow" might "probably" make. Such "creation" would, we allow, be "chaotic"; and it accords strangely with any "conception of the goodness and the "fullness of life." It is more like a nightmare. L.L.P.

6.—*The Standard of Living in Japan.* By Kokichi Morimoto, Ph.D., Associate Professor of Economics in Tohoku Imperial University. 150 pp., 8vo. Baltimore: The Johns Hopkins Press, 1918. Price $3.50.

This is not only an important contribution to the study of the standard of living, based on original research, but is also very interesting reading, describing as it does phases of Japanese life and customs in an accurate way that contrasts favourably with travellers' discursive impressions.

The research follows familiar lines. Budgets of food expenditure, but only few in number, were collected from families believed to be typical of their class; these were supplemented by a more extensive inquiry of individual and family annual expenditure on dress. The whole food supply of Japan is also considered, and the amount per capita worked out for each commodity. A study of housing is added.

The writer is a firm believer in measurement by calories, and has compiled a standard budget, "which can be approved from both "practical and theoretical standpoints," and utilises "the best in "both Japanese and foreign foods and in methods of cookery." The weight of an average Japanese is four-fifths of that of a European, and therefore it is argued he needs only four-fifths of the proteins, &c., taken by Voit as the amounts advisable for Europeans. His standard yields per "man" per day 101 grams protein, 44 grams fat and 399 grams carbohydrate, and cost in Tokyo in 1915 30·5 sen, or about 15 cents (U.S.A.). Professor Morimoto is a food reformer and embodies his suggested reforms in his budget, which differs from those put forward by the Japanese Bureau of Hygiene in that it contains 150 grams of wheaten bread and 80 grams of beef or pork. He argues that Japan depends too much on her home rice-harvest, which is barely sufficient even in favourable years, while imported rice is disliked, and that it is necessary to broaden the basis of the national dietary, and he believes that wheaten bread will become popular when it is better baked and prejudice is removed.

The peasant farmers, however, find rice too expensive a diet, and support life principally on barley (2 parts barley to 1 rice). They eat very little meat indeed: dried fish is used mainly for seasoning. The diet is made attractive by sweet potatoes and radishes, whose consumption over the whole of Japan is 178 lbs. and 123 lbs. respectively per "man" per annum. The peasant's diet, which costs only 12 sen per "man" per day, is well below the minimum recognised as sufficient. In fact, the whole food consumption of Japan is insufficient, and the general average is little better than that of the peasants.

Except in the poorest classes rice is the national food. "Plain "boiled rice without milk or sugar is consumed in large quantity "at every meal." "But the strong salty taste of pickled radish, "combined with the plain taste of boiled rice, makes the rice diet "so palatable as to completely satisfy the appetite without much "need of varied side-dishes." In the ordinary household a maidservant [called the *meshitaki-onna*, meaning "girl to cook boiled "rice"] must be hired, whose chief duty is to boil rice, and if there is no servant "the greater part of the housewife's time must be "devoted to the task." "Thousands of shrines are built in farming "districts, surrounded on all sides by rice paddies, in honour of the "god of rice."

Sugar is dear because of import duties, and is used very sparingly. It is surprising to find that the consumption of tea per capita is only $1\frac{5}{6}$ lbs. per annum.

Clothing is relatively more expensive in Japan than in European countries, because a considerable diversity is needed for the different seasons, owing to the defective heating of Japanese houses. The author attributes the high expenditure on clothing even from small incomes, where it amounts to about 20 per cent. of all expenditure to "the social custom of Japan, which puts more stress on matters "of costume and manners than on those things that are necessary "to rational and economical living." Among the richer classes an additional expense arises from the need of having "both European "and Japanese dress in order to appear properly on different occa-"sions."

A distinction is drawn between the "absolute standard of "living," sufficient only for bare existence and relative standards which are adjusted to decency, comfort and luxury in any particular society. He appears to consider the absolute standard as definable and obtained by primitive people; but we may well argue that no real definition can be given, since health, physique and well-being are relative terms, and different standards of food and shelter are necessary for different degrees of health and efficiency without decency, comfort or luxury. Every minimum standard yet proposed is a conventional one. Presently he speaks of an "efficient standard "of living," which allows for decency and comfort, but excludes luxury. He estimates that the "absolute standard" costs for a normal family for all expenditure 180 yen annually in small cities and the "efficient standard" costs 860 yen. As an essential for efficiency "the dining table should be set in artistic Japanese style."

A.L.B.

7.—*Cotton.* By George Bigwood. (Staple Trades and Industries. Edited by Gordon D. Knox, Vol. II.) 204 + viii pp., 8vo. London: Constable. 1918. Price 6*s.* 6*d.* net.

This very readable volume presents in a popular manner a brief account of a great industry. Mr. Bigwood traces the development of cotton from the time of Aristotle, describing the sources and methods of production, the remarkable inventions which were introduced chiefly during the eighteenth century, the marketing of the raw material and the finished product; and mentions some of the difficulties confronting those engaged in cotton manufacture at the present day. The first four chapters of the book are devoted to a descriptive account of the history of cotton production and the various stages in the development of the processes of manufacture. Despite the interesting reading such treatment makes, we cannot help wishing that at least as much space had been devoted to the progress of mechanical inventions and improvements after Cartwright's power loom (completed in 1787) as Mr. Bigwood bestows upon the customs and usages in the matter of cotton weaving prevalent in the centuries B.C. His story of the inventions during the Industrial Revolution reveals no new details of economic history, and we consider that an excellent opportunity of tracing the numerous improvements which were effected in the nineteenth century has been missed. Such a story is incomplete without the mention of more recent improvements, amongst which we may mention the weft fork and the automatic temple—the former permitting a greater speed in the loom, and the latter keeping the cloth automatically stretched instead of the loom having to be stopped every few inches to alter the stick which was stretched across to keep the woven cloth tight. This made the minding of one more loom per weaver immediately possible. Smaller improvements like the Barber Knotter have all tended to increase efficiency.

Mr. Bigwood successfully achieves his endeavour to describe how this "tropical shrub provides us with clothing, with food for "ourselves and fodder for cattle, with the raw material for paper; "it furnishes us with artistic tapestries for our furniture; all the "peaceful arts draw largely upon it, whilst the scientist has converted the white fibrous substance into a destructive agent. The "cotton plant is indeed a plant of general utility, and notwithstanding its deadly use on the battlefield may be said to have "exerted a wonderfully civilising influence in many parts of the "world's hinterlands." He discusses in detail the efforts to improve the cotton staple and increase the yield, and demonstrates the care bestowed on the plant until the flower and the "fruit" (bolls of cotton) reach maturity. He describes the gathering of the cotton and details the work of ginning and baling preparatory to shipment to the centres of manufacture, and strongly urges the "need for "widening the field of cotton culture in the British Empire," which contains "admirable places for cotton cultivation." In an interesting account of the ravages of the pests of "creeping, crawling, "boring and flying insects" ever trying to destroy the cotton plant he recommends the general adoption of recognized precautions. An efficient automatic picking machine has yet to be invented, and such a problem will be more easy of solution when by means of cultural research we secure "the development of a cotton plant "on which a large percentage of bolls will mature uniformly." "The world's cotton crop to-day is three times greater than it was "forty years ago, and if the raw material is to keep pace with the "demand for cotton goods, the extension of the cotton fields must "be taken in hand immediately."

Chapter VII describes the actual processes of spinning and weaving in a modern factory, and to the average reader is probably the most interesting in the book.

An interesting discussion (p. 79 *et seq.*) of the alleged deterioration in the quality and colour of Egyptian cotton caused by the effect of regulating irrigation by the erection of the dam at Assouan elicits the statement that the "demand for Egyptian cotton "largely exceeds the supply," although the effect of the dam was said to be increased production at the expense of quality.

It is clear that Mr. Bigwood is no friend of the "illegitimate" speculator, when he states that "the most serious evil to attend this "great industry is the manipulation of the markets," and following this he gives a well reasoned and clearly expressed tirade against the speculator "who simply dealt in 'futures,' selling that which "he did not possess, or buying that which he did not want "to use," acting as a pure gambler for his own personal gain, robbing the grower, the spinner, the manufacturer, and the labourer.

The book is well written, but one or two passages should be made clearer, *e.g.*, to the statement on p. 28 that "while one man with "proper machinery is able to cultivate about 20 acres of cotton, "the same man cannot pick more than 200 lbs. of cotton daily" should be added *inter alia* the average yield per acre, or the paragraph has no meaning. Again, on p. 63, speaking of the U.S. cotton production, it is stated that "this increase of 1,000,000 bales was "accompanied by an increased consumption in America which "rose from 2,000,000 to 2,500,000 bales, or half the increased "production." This is absurd until it is explained that the 1,000,000 figure is the *average annual* increase in production over five years, while the other figures are the *total* increased consumption over the same period. On p. 94 the word "cop" is used, but to the person outside the trade this is unintelligible until defined some pages later. The sentence on p. 100, "To distinguish the various "makes of cloth, a heading is frequently introduced which consists "of coloured threads of weft, put in at the commencement of the "weaving," would be more correct as follows: "In order *more* "*readily* to distinguish, etc."

Very useful statistical information is scattered about the book, and the following tables are noteworthy:—

Page 61 :—Cotton mills of the world, giving the number of mills, spindles, looms, bales consumed and hands employed in forty different countries.

Page 65 :—Disposition of American cotton crops, 1880-1916.

Page 71 :—Approximate estimate of cotton grown in new fields in the British Empire.

Page 75 :—A list of cottons—their length, colour and the counts for which they are suitable.

Page 77 :—Egyptian Government acreage returns, 1911–16.

Page 83 :—The world's cotton crop returns.

Appendix II :—Number of firms, spindles and looms in Lancashire.

Numerous excellent photographs are reproduced and three appendices and an index complete a well presented treatise. A.F.

8.—*The New Tariffism.* By J. M. Robertson. 63 pp., 12mo. London : George Allen and Unwin. 1918. Price 2*s.* 6*d.*

Mr. Robertson is a free-trader of such stout conviction that he would, we suspect, find no flaw in the theory, nor could he readily admit any exception to the practice in its full integrity, of his fiscal creed. This short emphatic essay is directed to the recommendations of the " Balfour Committee," the Chairman and " several " members of which were " avowed free traders." But they were, we are told, " deflected " by " proposals of the Paris Conference " that had " no " enduring significance " because they were a " mere counterblast " to the customs scheme of " Middle Europe " afterwards abandoned by the Central Powers. The Committee in consequence did not perform their proper duty of returning " clear answers " to " clear " issues." They fell, on the contrary, into the " initial blunder " of suggesting " prohibition " " for some term " of " imports of " enemy goods." That bad policy implied, in our author's view, the " vetoing " of " adequate payment of indemnities by Germany " to our Allies," and it rested, so he urges, on misunderstanding of the " peace " which would, or could, be made. This particular affair is prominent throughout ; but we gather nevertheless that the observations which the Committee offered on the four matters referred to them, if they were not the plain replies demanded by their critic to the questions put, cannot satisfy him on their independent merits. On Imperial Preference, even in the milder shape of subsidized Canadian steamships bringing food, he sternly frowns, and he suggests fatal objections ; to the " maintenance " of " key " or " pivotal " or " essential " industries he cannot see a clear or safe approach ; the " protection " of " selected " manufacturing or trading enterprise is, in his adverse opinion, supported by " bad " arguments or none ; and the " business of legislating against dump- " ing " is " beyond intelligent handling " by " tariffists." Mr. Robertson does not mince his language ; and he is a keen, stimulating and amusing controversialist. He knows thoroughly his own position.

Yet he seems unable to appreciate more than the one side he favours of debated questions. He is a robust advocate who would browbeat opposition. We may admit that the problem of securing an "indemnity," or "reparation" for the injury she has done, from Germany is a hard crux which may test the astuteness and need all the discretion of the Allied statesmen. But it is by no means certain that it cannot be met without repetition of the harm inflicted, or the menace offered, before the war by "peaceful pene-"tration." Nor, as actual experience has shown, is it quite impossible for that slim manipulation of tariff-mongers, which Mr. Robertson hates and scorns, to contrive to exert a decisive influence on the kinds as well as the amounts of imports and of exports. Such apt discrimination differs of course from universal prohibition. It does not seem necessary to our economic welfare that our enemies should be supplied by us with raw materials, and that we should take their manufactured goods in payment of their debts. Since this very essay was written the armistice imposed upon our foes has followed on the speedier achievement of a more complete discomfiture than was once thought feasible; and the changing probabilities of the "peace" to be dictated require readjustment of the inferences then drawn. Concession, however, in the polemics of pamphleteering is uncongenial to a born fighter of Mr. Robertson's calibre and temper; and it would not be easy, or perhaps worth while, to dislodge his ingrained prejudice, which contrasts the "fundamental economic truths upon which Free Trade stands" with a "faction-dogma"—whatever that opprobrium may mean—like "tariffism"; or to shake the sanguine confidence which can assert and believe that, "if Britain plays the fool to the extent of "setting up a tariff, and there is any political wisdom left in Ger-"many" after the war, "it will be to her interest to gravitate to "Free Trade as quickly as possible." Our author evidently thinks that movement likely to occur, while he has no doubt that "we are "already heading for the rapids." He appeals indeed loudly to "the democracy" to stop a policy which, he admits, has found "adherents in all three British Parties—Conservative, Liberal and "Labour." It has also, to his profound disgust, frankly declared in this small book, won the assent in war-time of the "avowed free "traders" of the "Balfour Committee." No circumstances will avail with him to condone such temporising: but one-sidedness may perhaps exert a bracing influence on firmer friends. He knows at least how to state a case with effect, and his outspoken partiality compels attention. L.L.P.

9.—*Can We Compete?* By G. E. Mappin. x + 159 pp., 12mo. London: Skeffington and Son, 1918. Price 4*s.* 6*d.*

This small book, which receives in a "foreword" the balanced praise of a well-known man of business, is said on the title-page to deal with "Germany's assets in finance, trade, education" and "consular training," and to offer a "programme" for the "reduc-

"tion" of British "war-cost." That is an ambitious aim. The author, we are told in his Preface, has "studied at two German "technical universities," "worked in and visited German works," and "made the acquaintance of numerous German diplomats, "officers, officials, professors, businessmen and workmen." We may agree that the wholesome maxim, which the essay illustrates, laying stress on the material advantage of learning duly from our enemies what they can teach, has a special pertinence to the example set, or the model offered, in some important respects in trade and industry, and particularly in education, by the formidable foes we have now beaten on the battle-field where their superiority was most loudly boasted. Mr. Mappin, it should be remembered, wrote his book, "showing" their "strength," and "some methods for "ensuring their defeat" last July, before the Germans had been forced to acknowledge our decisive victory. The painstaking aptitude of German schemes and methods had been exhibited to all the world in many spheres of action; and there can be no question that they have been "scientifically" planned and executed. With the help of exact full knowledge diligently gathered and carefully digested, and of corresponding training in the precise minutiæ of elaborate preparation, they were skilfully designed to reach by means mapped and measured to the last detail ends clearly envisaged and consistently pursued. The results, if not always to be commended, have often been remarkably successful, though the process conducting to this goal needed throughout authoritative direction and would not stimulate independence or permit much originality.

We are glad however to observe that Sir Robert Hadfield, recognizing that "many of the points" which are here raised "contain "useful suggestions," courageously protests that in "the teaching "of metallurgy" the University of Sheffield "has nothing to learn "from Germany"; and he thinks, rightly, that Mr. Mappin is a "little inclined to magnify the efficiency of the Germans." In further criticism we should add that, while the general plan of arrangement followed is somewhat discursive, the treatment of particular topics might in some cases be described as "sketchy." We cannot see that the essay fulfils obviously the purpose, which is announced, of supplying particular details of the reforms required, unless that object can be said to be achieved by bare lists or dry catalogues. Nor are the "proposals" offered for "co-ordinating "the five groups of interests which constitute our economic life"—"agricultural, industrial, commercial, labour and general"—actually so "definite" as the confident language of the author might suggest. He tries, indeed, to deal in a short space with so much of so varied a character that he is debarred from full discussion or satisfying explanation. Yet he is shrewd and alert; and his acquaintance with Germany and Germans is the outcome of direct appreciative observation. It is a first-hand personal study from which he draws the lessons he would convey to his own countrymen, if this is not entirely, as he claims, the earliest time that such material has been placed before English readers. The book, however, has the great advantage of being opportune, and it evidently proceeds from strong deliberate conviction. L.L.P.

10.—*Other New Publications.**

Bachi (*Riccardo*). L'Italia Economica nel 1917. xvi + 312 pp., 8vo Città di Castello, 1918. Price L.8.

[This useful survey is now in its ninth year of publication and is a valuable record of the economic conditions of Italy during 1917, in their commercial, industrial, agricultural and financial aspects. The book is divided into two parts, and contains a bibliography of economic publications, official and unofficial, issued during the year.]

Berry (*Lieut. Trevor B.*). An Appreciation of the League of Nations Scheme. 192 pp., 8vo. London: P. S. King and Son, 1919. Price 5*s.*

[Although this little book is dated 1919 it was written before the armistice and has been rather overtaken by events. It represents the ideas of an "ordinary citizen and temporary soldier" on the real significance and essential conditions of a League of Nations, and emphasises the need for sacrifice on the part of each associated nation if a real world harmony is to be attained.]

Carnegie Endowment for International Peace. The Growth of Liberalism in Japan. By Tsunejiro Miyaoka. 24 pp., 8vo. Washington, 1918.

[Two addresses given before the American and Canadian Bar Associations respectively and entitled (i) The Safeguard of Civil Liberty in Japan (ii) The Growth of Representative Government in Japan. The first describes, in thirteen pages, the provisions of the Japanese Constitution which secure the liberty of the person, privacy of correspondence, right of property, equitable taxation, freedom of speech, writing, association, public meeting, &c. The second is a concise account of the political transformation of Japan, tracing the chief changes which took place between 1867 and 1900. The oath taken by the late Emperor on the institution of the new regime in 1868 is quoted in full; its five remarkable sentences embody a general plan of government which has proved as practical as it sounds ideal, and are not unworthy of attention at the present day.]

Craig (*Walter Lennox*). Sterling Decimal Coinage. (Part of Part Two: interim copy.) 47 pp., 8vo. Maryport, 1918.

[The author lays stress on the difference, imperfectly recognised by the general public, between coins of account and coins of convenience, and points out that while in a decimal system the former must be fixed in a series of tens, the latter, used merely for giving change, are adaptable to any system which may be convenient for buying and selling, *e.g.*, to the binary system, which is that used in nearly all countries for the fractional purchases of the poor. A table is given of seventeen countries using fractional binary coins of exchange, and a strong case is made out for the retention of this system for the coins of convenience in any decimal scheme that may be introduced into the United Kingdom. The subject is developed in some detail, and several alternative series of decimal and submultiple coins are presented for comparison and consideration.]

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* See also "Additions to the Library," page 277, *seq.*

The Disclosures from Germany. 53 pp., 8vo.

[Contents: I. The Lichnowsky Memorandum. The Reply of Herr von Jagow. II. Memoranda and Letters of Dr. Muehlon. Translation, Introduction and Notes by Munroe Smith. III. The Dawn in Germany? The Lichnowsky and Other Disclosures; by James Brown Scott.]

Edgeworth (*F. Y.*). A Levy on Capital for the Discharge of Debt. 32 pp., 8vo. Oxford: Clarendon Press, 1919. Price 1*s*. net.

[This lecture balances in characteristically judicial fashion the various considerations for and against a levy. Professor Edgeworth meets the objections on the ground of infringing the principle of equal sacrifice by resting upon *minimum* sacrifice. He does not set great store by the fear of repetition, but is inclined to conclude that an immediate capital contribution spread for a few years, with a corresponding extra income tax on earned incomes and smoothly graduated, is not without merits. He does not, however, *clearly* distinguish this from a modified income tax. "We should hold ourselves in readiness to adopt a levy on capital, but should not initiate the scheme until after further observation and reflection."]

Garton Foundation. Memorandum on the Industrial Situation after the War. 175 pp., 8vo. Harrison and Sons, January, 1919. Price 2*s*.

[This memorandum, the work of a group of men, was first printed in 1916, and the new edition has been revised and added to in the light of after-war conditions and later developments of the industrial situation. Section A, "The Industrial Situation To-day," has been entirely re-written, and the portion of the book relating to Joint Industrial Councils and Trade Boards consists altogether of new matter. The authors state that they have tried to "consider the industrial problem as a whole and as an integral part of national life." The first edition was not published until a private circulation had enabled them to receive criticisms and suggestions from all classes with which the book is concerned.]

Gras (*Norman Scott Brien*). The Early English Customs System: a documentary study of the institutional and economic history of the Customs from the thirteenth to the sixteenth century. 766 pp., 8vo. Cambridge, Mass.: Harvard University Press, 1918. Price 15*s*.

[The larger part of the book consists of the actual text, mostly given in full, of the Customs documents, local, semi-national, and national, in the original languages, with translation and explanatory comment. The list begins with the Billingsgate Tolls of the 11th century. The first three chapters of the book review the history, institutional and economic, of the Customs, and the fourth is a very helpful introduction to the documents. Incidentally, the author traces the history of the chief English Ports, and brings out many interesting facts as to their growth, individual importance, and relations with the sovereign; an important contribution is also made to the history of the Hanseatic League. In short, the book contains much valuable information for students of economic history and mercantile law, the antiquary, and even the genealogist; for the names of the merchants exporting or importing are commonly given. Occasionally the traders are women, and frequently sailors.]

Jannacone (*Pasquale*). Relazioni fra Commercio Internazionale, Cambi Esteri, e Circolazione Monetaria in Italia nel quarantesimo 1871–1913. 82 pp., 8vo. Torino: *La Riforma Sociale*, 1918.

[A statistical study on foreign exchanges in relation to movements of international trade and Italian monetary circulation in the forty years ending 1913. The author traces the correlations existing between the movements in the exchanges and the excess of imports over exports and expansion of the country during the period in question. There are several diagrams.]

Jarvis (*W. H.*). Railway Stores Methods and Problems. 115 pp., 8vo. London: *The Railway Gazette*, 1918. Price 4*s.* net.

[This little volume, packed with matter, is a practical guide to the organisation and efficient running of a railway stores department. It is suggested that some portion of the much needed economy in railway costs might be effected by improving the efficiency of this branch, notably through a wise selection of officials and the adoption of scientific methods. The author has worked out a very complete scheme for dealing with the purchase, storage and distribution of material. He attaches much importance to a proper system of "control statistics" by which a just balance between stocks and consumption may be maintained, and points out the value of the "assistance which a carefully compiled series of price index-numbers will afford to the stores superintendent" in this matter.]

Preiser (*S. A.*) and *Davenport* (*C. B.*). Multiple Neurofibromatosis (von Recklinhausen's Disease) and its Inheritance: with description of a case. 34 pp., 8vo. Cold Spring Harbour, N.Y.: *American Journal of Medical Science*, October, 1918.

[A detailed description of the disease, associated symptoms and influences, recurrence in families, and pathology, with very full bibliography, numerous diagrams, and photographic illustrations.]

Rhodesia. Report of Mr. W. M. Acworth, Commissioner appointed to inquire into Railway Questions in Southern Rhodesia. Republished by the Railway Commission Committee. . . . 80 pp., fol. Bulawayo: Argus Printing Co., 1918.

[Mr. Acworth was appointed to inquire into certain complaints respecting railway matters in Southern Rhodesia, and this Report is the result of his investigations, made on the spot. The subject is considered under three heads, namely, the financial history of railways, their financial policy, and their policy in regard to railway rates. As to the wave of depression which would appear to have passed over the public mind, the author considers that there is no ground for despondency, and that the misapprehensions and mistrust that have arisen have been due partly to a policy of reticence on the part of the railways which he considers unwise; absence of public control would appear to be another factor calling for change. Printed with the report are several papers, including a Memorandum by the Railway Commission Committee and a reply by Mr. J. G. Macdonald on behalf of the Rhodesia Chamber of Mines, both of which criticise the report in certain details.]

Rutter (*F. W. P.*). The Great Peace. 86 pp., 4to. (Privately printed.)

[The author describes his brochure as "notes roughly thrown together." Their main purpose is to exhort the Allies to make the most of their victory. Some useful data are included, namely, a calendar of the chief events of the war; two maps showing, respectively, Germany's aims and achievements; some brief statistical notes on the German colonies and the European and Asiatic territories in question; estimates of the cost of the war in lives and money; and appendices setting out the President's "fourteen points" and "four great aims" the conditions of the Brest-Litovsk and Roumanian peace treaties, and the terms of the armistices concluded with our several foes.]

Stilwell (*A. E.*). How to reduce your Income Tax by Liberty Currency. 70 pp., 8vo. London, New York and Toronto: Hodder and Stoughton. 1918. Price 1*s.* 3*d.*

[Stated briefly, the author's medicine for the ills resulting from an inflated currency is the creation of currency. This is to be effected by a gradual exchange, on demand only, of War Stock and Bonds (up to 3,000,000,000*l.*) for a paper currency to be "legal tender for all Government and private debt." One-fiftieth would be withdrawn and paid in gold each year

Stilwell (*A. E.*). How to reduce your Income Tax—*Contd.*

after the fifth of issue, and gold production to be stimulated accordingly. It is argued that an increase in the circulation will provide the funds so greatly needed for financing industry and maintaining wages, and, incidentally, produce a large income tax; but the author does not explain how to avoid a corresponding increase in prices which would nullify the latter benefit; nor does he pause at the prospect of prolonging the artificial prosperity which is generally recognised as an important factor of the present unsatisfactory conditions, both industrial and financial.]

Sheffield (*Lord*). Imperial Preference: an Examination of Proposals for its Establishment made on behalf of the Government of Mr. Lloyd George. 35 pp., 8vo. London: Cobden Club, 1919. Price 6*d.*

[The argument of this little book, summed up in the author's conclusion, is that "no preference which will be of value to our colonies can be given without fatal injury to our economic existence," and Lord Sheffield further challenges the desirability of any form of protection in this country, both on economic grounds and those of international and inter-imperial relationships. The first statement is supported by a detailed examination of the import and export figures (for 1913) showing the proportion of trade, in each of the main categories, with the Dominions and foreign countries respectively. The result shows the practical difficulties involved in a scheme of Imperial Preference which is not to include taxation of food or raw materials at present untaxed. It is also contended that since certain partly manufactured metals are in fact the raw material of British industries their inclusion in the scheme is contrary to its spirit, while their exemption would still further reduce the effectiveness of any colonial preference.]

Watkins (*Alfred*). Must We Trade in Tenths? 8 pp., 8vo. Hereford: Watkins Motor Co., 1919. Price 3*d.*

[The cover informs the reader that this is "a plea against decimal and for octaval coinage," but the British public will hardly be persuaded to exchange a familiar system of accounts for one which, if more logical, presents no compensating simplicity of reckoning—which outstanding merit of the decimal system is, by the way, ignored in this comparison. The convenience of a binary division can be more simply attained by the expedient of sub-dividing the main decimal coins—see the note on Mr. Craig's book, above.]

Yves-Guyot. Les Garanties de la Paix. 2e Partie. Examen Critique. x + 287 pp., 8vo. Paris: Felix Alcan, 1918. Price 3 frs. 50.

[A sequel to the volume issued early last year and briefly noticed in the May *Journal.* In the present volume the author examines the peace proposals of the Allies in comparison with the aims of the late Central Empires, and endeavours to show what possible solutions may be arrived at. He draws attention to the fact that the peace conditions which are being gradually evolved by the Allied Governments are those which were formulated in his book on the causes and consequences of the war, issued in 1915. The dismemberment of the Central Empires he considers a necessity, and a considerable portion of the book is devoted to the question as to how the new nations which, in consequence, will come into being may be assured of a political existence. The question of indemnities is also examined, and a final chapter deals with the League of Nations and the difficulties which it involves.]

CURRENT NOTES.

The important differences, previously mentioned in these notes, between the total values of our imports and exports appear to be increasing. During the period from July 1, 1917, to the present time, it is found that the imports exceeded the exports by 268,250,000*l.* in the second half of 1917, by nearly 389,000,000*l.* in the first half of the following year, and by over 402,250,000*l.* in the second half of 1918. In the two months, January and February of 1919, the excess amounted to over 137,500,000*l.* The values of the exports in these two months show notable increases, the totals for produce and manufactures of the United Kingdom being larger than in any month since October, 1917, while the re-export trade amounted to nearly one-third of the total for the whole of the year 1918.

A comparison of the totals during the twelve months ended February, 1919, with those for the previous twelve months shows an increase of over 23 per cent. in the value of imports, a decrease of over 2 per cent. in exports of United Kingdom produce, and of over 40 per cent. in re-exports. The figures for the months March to June of 1917 are exclusive of the values of certain imports of publicly owned merchandise, and apart from these undisclosed values the comparison of imports and exports is given in the following table :—

	Twelve months ending February, 1919.	Twelve months ending February, 1918.	Increase (+) or Decrease (−).
Imports, value c.i.f.—	£'000.	£'000.	£'000.
I. Food, drink and tobacco	605,267,	452,977,	+ 152,290,
II. Raw materials and articles mainly unmanufactured	468,024,	404,193,	+ 63,831,
III. Articles wholly or mainly manufactured	282,580,	236,422,	+ 46,158,
IV. Miscellaneous and unclassified (including parcel post)	7,041,	7,091,	− 50,
Total merchandise	1,362,912,	1,100,683,	+ 262,229,
Exports of produce and manufactures of the United Kingdom, value, f.o.b.—			
I. Food, drink and tobacco	12,537,	14,919,	− 2,382,
II. Raw materials and articles mainly unmanufactured	61,942,	66,512,	− 4,570,
III. Articles wholly or mainly manufactured	416,988,	422,889,	− 5,901,
IV. Miscellaneous and unclassified (including parcel post)	20,498,	19,377,	+ 1,121,

	Twelve months ending February, 1919.	Twelve months ending February, 1918.	Increase (+) or Decrease (−).
Exports of foreign and colonial merchandise, value f.o.b.—	£'000	£'000.	£'000.
I. Food, drink and tobacco	6,343,	5,463,	+ 880,
II. Raw materials and articles mainly unmanufactured	15,126,	35,785,	− 20,659,
III. Articles wholly or mainly manufactured	13,215,	16,876,	− 3,661,
IV. Miscellaneous and unclassified	21,	60,	− 40,
Total British, foreign and colonial	546,670,	581,881,	− 35,211,

The following are the percentages of unemployed shown by the Trade Union Returns and the returns under the National Insurance Acts, continued from the table on page 107 of the January JOURNAL :—

Percentage at end of	Trade Union returns.	National Insurance Acts.	
		1911.	1916.
December	1·2	6·62	6·91
January	2·5	10·06	9·62
February	2·8	11·82	8·09

At the end of November the Trade Unions making returns showed 0·5 per cent. of their members unemployed, and by the end of February this proportion had risen to 2·8 per cent. The increase in unemployment among workers insured under the 1911 Act was even more marked, the percentages given in the table above, comparing with an average of about 0·6 per cent. during the later months of hostilities. The comparison of the statistics of workers insured under the 1916 Act with those for earlier months is vitiated by the exclusion of certain classes of workpeople who are insurable only when employed on certain classes of government work. During hostilities the statistics for workers under the Insurance Acts were exclusive of men serving with the Forces, so that the increase in the unemployment percentage since demobilization does not imply a corresponding contraction of industry. This is shown by the employers' returns for the textile trades and other industries, which give for December to February a steady, if slow, expansion in the numbers employed, with the important exception of the cotton industry, where the numbers fell by 1·7 per cent.

between January 25 and February 22. As compared with a year before, the figures show decreases of 2 to 5 per cent. in the numbers employed, accompanied by increases of 15 to 25 per cent. in the wages paid.

Week ending	Textile trades. Percentage change on a year ago.		All trades covered by the returns. Percentage change on a year ago.	
	Numbers employed.	Wages paid.	Numbers employed.	Wages paid.
December 22	−5·2	+15·8	−3·5	+18·4
January 25	−3·1	+21·3	−1·7	+21·7
February 22	−5·2	+25·6	−2·2	+23·8

In connection with the Government's temporary system of non-contributory out-of-work donations for ex-members of the Forces and civilian workers, the number of policies issued up to the end of December was 419,322 to civilian workers and 149,324 to demobilised members of H.M. Forces, a total of 568,646, and the number remaining lodged at Employment Exchanges on January 3 was 380,695. The number and composition of the claims on various dates were as follows:—

Date.	Men.	Boys.	Women and girls.	Demobilised members of H.M. Forces.	Civilians.	Grand total of policies remaining lodged.
January 3	125,328	16,988	238,379	23,988	356,707	380,695
January 31....	230,677	22,562	425,464	53,554	625,149	678,703
February 28	393,265	28,019	527,336	166,257	782,363	948,620

The numbers of persons insured under the Acts of 1911 and 1916 included in these totals were 231,756 on January 3, 353,647 on January 31, and 381,285 on February 28.

In a review of employment and wages during 1918 in the *Labour Gazette* for January, it is pointed out that in most industries the shortage of labour recorded in the preceding years of the war became even more marked, owing mainly to further recruiting, and partly to the increased demands of our own and the Allied Forces for equipment. A factor working in the opposite direction was the reduction in the available quantities of raw materials, the textile trades being particularly affected in this respect. The percentage of unemployment among members of Trade Unions at the end of each month up to November ranged from 1·2 for March to 0·4 for October, the difference between these two percentages being due almost entirely to the cotton trade. With the signing of the Armistice the trades most affected were the engineering and allied trades, also the building and woodworking trades, which were largely employed on government work, the result being a return of the general unemployment rate in December to the maximum recorded for the year. As a consequence of these two factors, scarcity of raw materials and the cessation of war demands, the average rate of unemployment for the year 1918 was slightly above that of 1917. The averages of the monthly percentages for the last sixteen years are as follows:–

1903	4·7	1909	7·7	1915	1·1
1904	6·0	1910	4·7	1916	0·4
1905	5·0	1911	3·0	1917	0·7
1906	3·6	1912	*2·4	1918	0·8
1907	3·7	1913	2·1		—
1908	7·8	1914	3·3		—

The number of labour disputes reported during the year, and the number of workers directly or indirectly involved in them, were much greater than in any of the preceding four years, but the total number of working days lost was not greatly in excess of that for 1917, and was considerably below the numbers for any year in the period 1910–1914.

The upward movement of wages which began in 1915 continued in 1918. The number of workpeople whose rates of wages were reported to the Department as changed, with the net increases in weekly wages in 1917 and 1918 respectively, were as follows:–

	Number reported whose wages were changed.	Net increase in weekly wages of those affected, as compared with preceding year.
		£
1917	5,029,000	2,307,000
1918	5,654,000	2,783,000

These figures include increases granted to boys, women, and girls, as well as to men, for whom alone the average increase per head would be greater than is suggested by the figures quoted. The most noteworthy feature of the increases recorded was the

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* Omitting two months affected by the general coal strike.

wide extension to allied groups of workers of the 12½ per cent. bonus granted towards the end of 1917 to men engaged at plain time rates on munition work in engineering and shipbuilding establishments. In addition to the changes recorded above, many important changes occurred among unorganised workers and escaped attention; further, changes of wages in certain important classes of labour, such as agricultural workers, railway servants, seamen, and government employees, are not included because the numbers affected were not reported. Among these, the wages of agricultural labourers were further raised by the operation of the Agricultural Wages Boards, which fixed minimum rates, varying from 30*s.* to 36*s.* 6*d.* per week in England and Wales, from 30*s.* to 38*s.* in Scotland, and from 18*s.* to 25*s.* in Ireland, with higher rates for special classes. Railway servants received successive additions to the war wages, making the total war wage for men 33*s.* per week, with corresponding adjustments for boys and women. Seamen on vessels subject to war risks received a war-risk bonus of 3*l.* per month, and increases in minimum rates were also arranged in nearly all the trades covered by the Trade Boards.

German Trade Union returns covering 2,508,000 members, showed 6·5 per cent. as unemployed at the end of January, as compared with 5·1 at the end of December, and 1·7 at the end of January, 1918. The *Labour Gazette* gives quotations from the German press illustrating the rapid growth of unemployment in January. This is attributed to the scarcity of raw materials, the break-down of transport, the payment of large out-of-work donations, and a general disinclination to work. The last-named factor is probably to some extent a genuine result of the food-supply conditions in the country. In Holland the percentage of unemployment in all the Unions making returns rose steadily from 9·2 in July, to 11·8 in November, the rate for August, September, and October, being 9·9, 9·9, and 10·2 respectively, as compared with rates fluctuating between 8·7 and 9·5 for the corresponding months of 1917. If the diamond workers be excluded, the range among the remaining industries in these months of 1918 was from 8·5 per cent. in July, to 10·8 per cent. in November. The rates of unemployment in Norway, as recorded up to the end of November, were still comparatively low, rising from 1·1 per cent. at the end of September to 1·8 in October, and 2·1 in November, but they show a uniform increase over the rates a year before, which varied from 0·9 to 1·1, such increase being most marked in the large class of metal workers. In Sweden from July 1, the rate of unemployment declined till

September 1, the figures for the three months being 4·6, 4·2, and 3·5 per cent. respectively, as compared with 3·1, 3·3 and 2·8 for the corresponding months of 1917.

The average rise of retail food prices in the United Kingdom since July, 1914, which was put at 129 per cent. on December 2, rose by less than 1 per cent. in the following month, and remained at 130 per cent. on February 1, thereafter falling to 120 per cent. on March 1. Up to February 1, there was no substantial change in the prices of the articles enumerated, all of which were controlled. Between that date and March 1, the fall in the index was mainly due to a reduction of 2*d.* per lb. in the official maximum meat prices, a fall of 1½*d.* per lb. in the price of margarine, the removal of which from control was announced for March 1, and a seasonal decrease of 8¼*d.* per dozen in the price of eggs.

After allowance for changes in consumption, the estimated increase in *expenditure* upon food, which was put at 90 per cent. on December 2, fell on January 1 to 79, at which it stood also on March 1, after a slight fall to 77 on February 1. The maintenance of this index, relatively to the fall in the index of prices, was due to the improvement of supplies, as in the case of meat and sugar, and in a less degree, margarine and cheese. A combination of the average increase in expenditure upon food since July, 1914, with the average increase in the retail prices of other items (including rents), yields a resultant increase of about 90 per cent. on January 1, at which it remained till March 1. To this figure the customary caution is to be attached that, since no allowance is made for changes in the quantities purchased other than in the case of food, the estimate is in excess of the actual average increase in family expenditure.

In the Dominions the latest data, as quoted by the *Labour Gazette*, show a continued upward tendency in the price of food. In Canada, in December, 1918, the increase in expenditure upon food since July, 1914, was 84 per cent., assuming the family dietary to have remained the same throughout, while the estimated increase in total expenditure upon food, fuel, lighting, rent, &c., was 53 per cent. The increase on pre-war food prices in New Zealand rose from 40·7 per cent. in August, to 41·6 per cent. in October, while food prices in Australia increased in October a further 2·1 per cent., bringing the total increase in this case to 30·7 per cent. In South Africa (Cape Town) the price of food showed very little change between July and December, standing at 44 per cent. in advance of pre-war prices, but the increase in family expenditure, including rents, rose during the second half of 1918 from 36·4 per cent. to 39 per cent.

In the United States, retail food prices rose 2 per cent. between the middle of July and the middle of August, and a further 4 per cent. in the following month. Current prices are now compared with the prices for the corresponding months of 1913, and on this basis the increase for August, 1918, was 70 per cent., and that for September was 72 per cent. The general level of retail prices in French towns with over 10,000 inhabitants (excluding Paris) during the third quarter of 1918 was 144 per cent. above that of the fourth quarter of 1914, while in Paris in July, to which the latest date refer, the level of retail food prices was 106 per cent. above that for July, 1914. The latest data available for Italian towns generally refer to July, 1918, when the increase in retail food prices on July, 1914, was 153·1 per cent. Later data are available for Rome, where, in December, the increase in food prices was 154 per cent., and that in general expenditure, 138 per cent., also for Milan, where in January the increases in food prices and in general expenditure were 290 and 253 per cent. respectively, or, if account be taken of changes in consumption, 163 and 169 per cent. respectively.

In Sweden the increase of household expenditure for November, 1918, since July, 1914, on the basis of a fixed rate of consumption, was 220 per cent. In Denmark, where the estimate is adjusted for changes in the rate of consumption, the increase in January, 1919, was 86 per cent. in food, and 89·9 per cent. in general expenditure. A similar adjustment has recently been made in the estimates issued by the Norwegian Department for Social Affairs, which put the increase for November since July, 1914, at 175 per cent. for food, and 155 per cent. for general expenditure. In Amsterdam, retail food prices in September, 1918, were 97·8 per cent. above those of 1913. The increase in the prices of food and other household necessities in Switzerland between June 1, 1914, and December 1, 1918, was 152 per cent., that for food prices alone being 132 per cent.

As regards wholesale prices in the United Kingdom, the *Statist* index-number fell from 196·0 at the end of December, to 192·1 at the end of January, and 187·5 at the end of February, as against 82·4 for July, 1914. The *Economist* number showed an equal decrease over the two months, but assigned more of it to the earlier month, the index falling from 277·0 at the end of December to 265·9 at the end of January, and 263·8 at the end of February.

The Board of Trade index-number of wholesale prices is given in the *Labour Gazette* for January. The course of this index-number since the beginning of the war is as follows:—

1914	January—July, ...	113·6	117·2
	August—December,	122·6	
1915	....		143·9
1916	....		186·5
1917	....		243·0
1918	....		269·9

This makes the average level of wholesale prices in 1918 11 per cent. above that of 1917, and about 120 per cent. above that of the first five months of the war, the latter result being practically identical with that given by the *Economist* index-number.

"The Division of the Product of Industry," by Dr. A. L. Bowley, is a very valuable contribution towards the solution of the industrial problems now before the country, inasmuch as it affords a precise measure of facts and figures for the many conflicting statements and loose assumptions which a public ignorant of the realities has been unable to estimate intelligently.

Two seemingly contradictory assertions, by Mrs. Sidney Webb and Sir Hugh Bell respectively, serve as a text. The former states Labour's share of the industrial product as one-third of the total, while the latter puts it at 75 per cent. In order to arrive at the truth, and to determine the possibilities of a redistribution of the national wealth, Dr. Bowley examines the figures of the pre-war national income, its distribution between various grades of the population, the profits of industry, and their apportionment as between the several classes who combine to produce them. The calculations are based on the figures for 1911, the latest year for which accurate population and occupational returns are available. For the figures relating to the output of the various industries it has been necessary to adjust to that year those of the 1907 Census of Production, and in the case of the coal-mining industry, to go back to the Wages Census of 1885 for the fundamental figures; and it is justly pointed out that the lack of method and co-ordination in our national statistics is much to blame for the prevalent misconceptions, even on the part of those most concerned, as to the real facts. In rendering the facts accessible, and presenting them with such conciseness and clarity, Dr. Bowley has done an inestimable service.

As the result of his calculations it appears that in 1911 the earned income under 160*l.* amounted to 1,046,000,000*l.*, or about half the national total, 782,000,000*l.* being paid as wages; and that the total income, earned and unearned, above 160*l.* came to 936,000,000*l.*, or, deducting receipts from abroad, 742,000,000*l.*, of which salaries absorbed 130,000,000*l.* It may be noted that the 782,000,000*l.* were shared by something over 15,000,000 persons, while the income-tax on the 936,000,000*l.* was contributed by 1,150,000. The 20,150,000 "occupied" men and women earned 1,669,000,000*l.* between them, the 11,000,000 male industrial workers receiving 631,000,000*l.* in wages, or a net annual average, allowing for sickness and unemployment, of 57·4*l.* apiece. The enquiry into the allocation of the net industrial product between wages, salaries, and profits, is confined to the productive industries included in the 1907 Census of Production, from which their gross and net output can be obtained, together with the number of persons employed at representative dates. Setting aside the allowance for depreciation and rates which is included in the "net output" of the census, Dr. Bowley gives the following estimate of the "division of the net output of manufacturing industries and mining in 1907" (coal-mining not being included) :—

	Millions.	Percentages.	
	£		
Wages....	344	58	68
Salaries under 160*l.*	24	4	
Salaries over 160*l.*	36	6	
Rents, royalties, interest and profits	188		32
	592		100

These figures appear to confirm neither Sir Hugh Bell's nor Mrs. Webb's computation of "Labour's" share. Dr. Bowley infers that Mrs. Webb was speaking of manual labour only, and he can only accept Sir Hugh Bell's estimate on the assumption that a part of what is usually classed as "profits" has been accounted as payment to owners for their services.

A division of the above figures between the separate industries exhibits a large variation in the relative percentages, the item of wages, for example, ranging from 83 per cent. in the building industry to 17 per cent. in brewing. Corresponding figures for coal-mining (in 1911) are given, but are necessarily rather rough approximations because of the lack of recent data already referred to.

The author lays bare his raw material and processes, leaving the reader at liberty to draw his own conclusions. His own summary informs us that of the 742,000,000*l.* of "home income" received by income-tax payers in 1911, 407,000,000*l.* may be taken as the profits of trade and professions, the average of salaries over 160*l.* being about 340*l.* and the average profit, roughly, 500*l.* a year. If all earned income, including that of active employers, had been reduced to 160*l.*, and national saving and national expenses deducted from the remaining 550,000,000*l.*, there would remain an available surplus of between 200,000,000*l.* and 250,000,000*l.* An equal division of this sum would just have sufficed to bring adult wages up to Mr. Seebohm Rowntree's pre-war minimum of 35*s.* 3*d.* weekly for men and 20*s.* for women. Dr. Bowley considers, however, that wages could probably receive some increase at the expense of profit—though this by no means applies to all industries—while something more might be effected by economical methods, reformed taxation, and curtailment of luxurious expenditure; and he urges the necessity of arriving at "a more reasonable distribution of the products of "industry" than that which has hitherto been accepted by the nation.

A recent paper read before the Society has received an unwonted amount of public attention during the past few weeks. It appeared in evidence before the Coal Industry Commission that the Government had based their negotiations with the miners largely upon estimates of annual profits of coal-mining appearing in the JOURNAL for July, 1918, and it was made a matter of comment in the daily Press that figures were known to the Society before they were realised by the Government. The whole of the aggregated results of profits that were before the Commission until the last day for receiving evidence were based on these figures, and Dr. Stamp was under cross-examination for nearly two hours on the subject of his paper, "The Effect of Trade Fluctuations upon Profits." He was at pains to explain that his object had been a correct representation of fluctuations rather than an accurate *aggregate* of the profit of the whole industry. On the last day the Inland Revenue witness put in the results of a special investigation into colliery accounts, and it appeared in evidence that the aggregate profits for four war years (for collieries assessed on a five year average) were 124,000,000*l.* against the aggregates estimated by Dr. Stamp at 125,000,000*l.* There was an interesting passage between Mr. Smillie and Dr. Stamp on the true functions of a statistician who has no axe to grind, which called forth the much-quoted remark by the miners' leader that he regarded the witness as "almost as useful as a miner."

The National Industrial Conference Board, Boston, Mass., in its Research Report (Number 10, pp. 52, October, 1918) has examined the methods and results of *Arbitration and Wage-Fixing in Australia*, and has given a clear and impartial survey of the administrative methods and their results, which should be of use to Australian readers as well as to the Americans for whom it is primarily drawn up. "Once started upon a program of social reform, they [the "Australian people] have followed it out towards the suppression "of sweating, the fixing of a minimum wage, and the establishment "of methods of conciliation and arbitration for the settlement of "industrial disputes." "In Australia the principle of unionization "of labour is not merely passively accepted, but actually fostered, "a situation radically different from that which obtains in the "United States." The Wages Boards of Victoria and the compulsory arbitration system of New South Wales, though different in conception, have gradually approximated in function. In 1904 the first Commonwealth Conciliation and Arbitration Act was passed, establishing a Court whose function is to adjudicate on questions extending beyond the limits of one State, including those relating to the minimum living wage. The wage is adjusted year by year in accordance with changes in the purchasing power of money, and the minimum is basic in all Australian wage settlements. "There "is no distinct tendency to treat the minimum wage as a maximum." But "there is evidence of a distinct tendency towards the relative "undervaluation of skill," which it may presumably be inferred has hindered the development of skill; if so, this is a most important and detrimental consequence of wage fixation. In fact, among the "conclusions" we read, "The system as a whole has "admittedly involved an economic cost in reduced efficiency of "production. The ultimate test is whether that cost is justified "by social advantages."

We have also received from the National Industrial Conference Board (Boston, Mass.), a report on Hours of Work as Related to Output and Health of Workers, dealing with Wool Manufacturing, and uniform with a previous publication which was concerned with the cotton factories. Eighty-five establishments, employing 65,058 operatives, are reported upon. The reductions of hours were various, but in a considerable majority the weekly hours, after reduction, were 54. Sixty-eight establishments fell into this class, thirty-eight of which had previously worked 56 hours, three 55 hours, two 57 hours, twenty-two 58 hours, one 59 hours, and two 60 hours. Of this group, fifty-five reported that total output decreased on shorter hours, seven found it maintained and six increased. The establishments in which output was either maintained or increased were small, including less than 7 per cent. of the total employed in the whole group. In several cases the decline in output was proportionately less than the diminution of hours, *i.e.*, the hourly rate of output improved. It is remarked "that the 54-hour "schedule in the wool-manufacturing industry has involved a net "loss in output, but that, taking the industry as a whole, this loss "has not resulted in a heavy burden upon production. The results "are considerably better from a production standpoint than those "disclosed in an earlier report by the Board on the cotton industry. "Thus, only six out of seventy northern cotton establishments "reported that output was maintained on a 54 or 55-hour schedule, "and even in these six cases, there were many exceptional condi-"tions which so qualified the results as to rob them of much signi-"ficance." The explanation seems to be that there is more scope for human variations in the wool than in the cotton industry, the former needs more skill, and, while a cotton weaver may tend from sixteen to twenty looms, the wool worker seldom tends more than two, and hardly ever more than four.

The report is of considerable interest, and contains, *inter alia*, an account of the industrial processes which renders the data less unintelligible to the ordinary reader than industrial statistics are often found to be.

A useful piece of work has been performed by the Carnegie Endowment for International Peace in publishing *Direct Costs of the Present War*, by Ernest Bogart, Professor of Economics, University of Illinois. The facts concerning the expenditure and loans raised up to December 31, 1917, by each of the belligerents are collected in convenient form, and the following is a summary of the "Direct War Expenditures" up to that date:—

	£
British Empire	4,700,000,000
United States	1,300,000,000
France	3,300,000,000
Russia	4,400,000,000
Italy	1,200,000,000
Other Allies	1,000,000,000
Total Entente Allies	15,900,000,000
Germany	5,000,000,000
Austria-Hungary	2,200,000,000
Turkey, Bulgaria	500,000,000
Total Central Powers	7,700,000,000
Grand Total	23,600,000,000

The book contains a summary setting out these figures in comparison with estimates of the national wealth and national income of the various countries, and from this comparison concludes that "only in the case of this country (United States) do there remain "any appreciable resources which may yet be drawn upon to "defray future costs." Such a conclusion is misleading. The estimates of national wealth (for what they are worth) are expressed in currency of quite different value from that in which the figures of war expenditure are expressed. The inflation which has occurred throughout the world renders it meaningless to compare expenditure incurred in 1914–17 with wealth calculated, in a number of cases, years before that era.

In 1917, in order to make better provision for scientific investigation in economics, Harvard University appointed a Committee on Economic Research. The Committee decided that its first effort should be in the field of economic statistics. Professor Persons, statistician to the Committee, has made a thorough study of existing methods of collecting and presenting data, and the results are to be set forth in a *Review of Economic Statistics*, a sumptuous and imposing quarterly publication, the first number of which has now appeared. All the statistics of banking and trade, etc., are presented with elaborate graphs and "trends," and advanced statistical analysis, criticising existing data. The Committee thus offers a "statistical service" in this publication at a cost of rather more than 20*l*. per annum, including monthly supplemental data, and it is, perhaps, in the matter of cost that the experiment will meet with its greatest difficulties.

An honorary list of twelve economists, selected for their work in the field of economic statistics, includes a Fellow of this Society, Dr. J. C. Stamp.

The whole enterprise is ambitious, but well conceived and worthy of all support.

All attempts to define a mean of several observed values of a quantity that shall be entitled to be considered the most probable value of the quantity seem bound to fail, and we may be satisfied with the dictum of Rikitaro Fujisawa in a recent paper on algebraic means in the *Proceedings of the Imperial Academy of Tokio*, that it is analogous to the representative in one capacity or another of a group of persons, among whom there may exist wide differences of opinion and inclination. Statisticians like to know other characteristics of the distribution such as the standard deviation or the skewness, just as politicians like to have several representatives of the group. Fujisawa, in the paper referred to, obtains many interesting results relating to scales of means and proposes as fundamental mean a quantity which, while it has no claim to being the most probable value, is certainly peculiarly characteristic of the distribution. The k^{th} algebraic mean of the n positive qualities $x_1, x_2. \ . \ . \ x_n$ is defined by the equation

$$M_k = \left(\Sigma x_1 x_2 \ . \ . \ . \ x_k \,/\, n\,C_k \right)^{\frac{1}{k}}$$

the summation referring to all the nC_k products of k quantities selected from the n given ones. There are n such means, call them $x_1', x_2', \ . \ . \ . \ x_n'$. Denote the algebraic means of $x_1', x_2, \ . \ . \ . \ x_n'$ by x_1'', x_2'', and so forth. If this process is continued indefinitely, the means so obtained converge all to one and the same limit. This limit is Fujisawa's fundamental mean. A simple example will make the process clear. Let $x_1 = 1$, $x_2 = 2$, $x_3 = 3$. Then $x_1' = \frac{1 + 2 + 3}{3} = 2$, $x_2' = \sqrt{\frac{1 \times 2 + 2 \times 3 + 3 \times 1}{3}} = 1{\cdot}191$, $x_3' = \sqrt[3]{1 \times 2 \times 3} = 1{\cdot}817$. At the next stage we have similarly $x_1'' = 1{\cdot}911$, $x_2'' = 1{\cdot}910$, $x_3''' = 1{\cdot}909$. If we confine ourselves to four significant figures the means of the third order all agree: $x_1''' = x_2''' = x_3''' = 1{\cdot}910$, so that to this order of accuracy the fundamental mean of 1, 2, 3 is 1·910. The mean here proposed is really a generalization of the arithmetico-geometric mean of Gauss.

Sir Robert Harry Inglis Palgrave.

On January 25 last Sir Robert Harry Inglis Palgrave, F.R.S., died at Bournemouth whither he had gone to pass the winter. Born in 1827, he was the third of the four distinguished sons of Sir Francis Palgrave (1788-1861), Deputy Keeper of the Public Records and Historian. His brothers, Francis Turner Palgrave (1824-97), Professor of Poetry at Oxford University, William Gifford Palgrave (1826-88), the Eastern traveller, and Sir Reginald F. D. Palgrave, K.C.B. (1829-1902), Clerk to the House of Commons, all won their way to fame in very varied walks of life yet were linked by love of literature.

Through his mother, Elizabeth, the daughter of Mr. Dawson Turner, F.R.S., Banker of Yarmouth, Sir Inglis was descended from an old family of country bankers, one of whom was Mr. James Turner, Mayor of Yarmouth in 1779, the first partner in the Yarmouth Bank of Messrs. Gurney and Co., established December, 1791. Educated at the Charterhouse, Sir Inglis began his banking career before leaving the school by spending part of his holidays at work in the bank.

In 1845 he formally entered Gurney's Bank, and became a keen student of banking and commerce. During his long and active banking career he was fated to see vast changes come over English banking. At the beginning of the nineteenth century English banking was entirely in private hands. In the City of London some 43 firms were members of the London Bankers' Clearing House, keeping their balances with the Bank of England, settling their differences by payments of Bank of England notes, but remaining otherwise aloof from the Bank, to whose Court no private banker could be admitted.

In the country each town had one or more bankers, some, like the Smiths of Nottingham, and the Gurneys of Norfolk, connected with the local trade, sending their sons and nephews to London to found banking partnerships and become the London agents of their country relatives. It was not till 1834 that the first London joint stock bank was formed under the title of "The London and Westminster Bank," and at once sought admission to the Clearing House, only to be told that the Committee "decline complying with "such request under the consideration that the Clearing House is "intended exclusively for the accommodation of private bankers." Greeted with scorn by the old private firms who formed the London Bankers' Clearing House, all requests on the part of the joint stock banks to become members were ignominiously refused. But the time of the joint stock banks was to come. In 1854 the London and Westminster Bank was admitted to the Clearing House but was allowed no part in its ownership or control. Other admissions, on the absorption of the private firms by the Joint Stock Companies, soon followed, and the day of the joint stock banks had come. This, in turn, was followed by the gradual absorption of country banks, private and joint stock, by the London banks, till the number of banks in the London Bankers' Clearing House, which was 43 in 1800, became 29 in 1839 and 11 in 1919, while the number of banking offices in the United Kingdom, which was in 1872 2,924, became in 1916 9,367, and the average number of population to each office fell from 10,767 in 1872 to 4,811 in 1916. All these changes in English banking, with the consequent reduction in the number of banks of issue, came within the span of Sir Inglis' long life. His it was, too, to live through and view the great financial crises of 1847, 1857, 1866, 1873 and 1891.

With such experience his advice and evidence was sought on many enquiries and commissions. In 1871 he wrote the essay on the "Local Taxation of Great Britain and Ireland," which won the Tayler Prize of this Society. In 1875 he was one of the three representatives of the English Issuing Country Bankers who gave evidence before the Select Committee of the House of Commons on Banks of Issue. In 1885 he served on the Royal Commission on the Depression of Trade and Industry, to which he contributed Appendix R of the Report. For six years (1877-83) he acted as (financial) editor to the *Economist*, and was also for a time the editor of the *Bankers' Magazine*, and edited the *Banking Almanac* up to the time of his death. Nor were these his only productions. A constant writer on economic subjects, he also wrote "An Analysis of the Transactions "of the Bank of England for the years 1844-78"; "The Bank Rate "and the Money Market in England, France, Germany, Holland, "and Belgium, 1844-1900"; and "An Enquiry into the Economic "Conditions of the Country (1909)."

Between 1899 and 1914 the *Dictionary of Political Economy* was brought out under his editorship, and the last years of his life were untiringly devoted to the preparation of a complete edition of the historical works, both published and unpublished, of his father, Sir Francis Palgrave, who was one of the first Fellows to join our Society.

Such, then, is a brief record of the life work of Sir Inglis, who was always ready to help with kindly advice and criticism the many friends and strangers who sought his opinion. By his friendly sympathy he gained a very wide circle of friends amongst bankers and economists, spread over many countries. They welcomed the honour of knighthood given him in 1909, and sent him, when he attained his ninetieth birthday in 1917 a letter of hearty congratulation. He also received a letter of congratulation signed by the University professors.

Up to the very last moments of his life he retained the keenest interest in all banking and economic problems, and feeble though he might be in body, his brain was ever active and alert, so that his death, which, curiously, was followed only four days later by that of his old colleague, Mr. A. S. Leslie Melville, Treasurer of the Country Bankers' Association, at an almost similar age, has removed a real landmark from the ranks of our Fellows.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Accountants' Magazine. February, 1919.—Some notes for students on trading and cost accounts.

Bankers' Magazine—

February, 1919—Financial facilities after the war. After the War—The Reconstruction Period: II. Banking Profits in the second half of 1918. Credit and Trade. The Progress of Banking in Great Britain and Ireland during 1918.

March, 1919—Banking and Currency after the War. After the War—The Reconstruction Period: III. Bankers on the Situation.

April, 1919—A British International Bank: *Hope (R.E.)*. After the War—The Reconstruction Period: IV. On the extension of British Branch Banks in foreign centres: *Spalding (W. F.)*. Commercial information and the British Banks abroad.

Board of Agriculture, Journal—

February, 1919—Food production in war and peace: *Middleton (Sir T. H.)*.

March, 1919—Some further investigations on the food of Wild Birds: *Collinge (W. E.)*. Imports, exports and supplies of agricultural produce of the United Kingdom during the war.

Economic Journal. March, 1919—New light on the economic causes of the French Revolution: *Knowles (L.)*. The Gold policy of the United States: *Cross (Prof. I. B.)*. Some aspects of War Finance: *Roussin (L. G.)*. The Gold question: *Stuart (C. A. V.)*.

Eugenics Review. January, 1919—Some attempts towards race hygiene in France during the war: *March (Lucien)*. The causes of human variability: *Fisher (R. A.)*.

Financial Review of Reviews. March, 1919—The interdependence of science and industry: *Collie (J. Norman)*. The Nemesis of Speculation: *Saleeby (C. W.)*. The Air-Service Restaurant Inquiry: *Hyne (C. J. Cutcliffe)*. What's wrong with Labour? *Good (E. T.)*.

Institute of Bankers, Journal—

March, 1919—Prospects of National Taxation: *Hoare (Alfred)*.

April, 1919—The independence of nations: *Paish (Sir G.)*. The Economics of a War Indemnity: *Addis (Sir C.)*.

Journal of Comparative Legislation and International Law—

December, 1918—Women as Practitioners of Law: *Riddell (W. R.)*. Telegraphic communication during war: *Bright (C.)*.

April, 1919—The origin and growth of income tax: *Cox (H. B.)*. Compulsory Purchase of Land: *Browne (J. H. B.)*.

UNITED KINGDOM—*Contd.*

Manchester Statistical Society. Session 1917–18—The Cotton trade at the close of the Napoleonic War: *Daniels* (*G. W.*). Certain influences affecting the national rate of population: *Poock* (*Rev. M.*). Lancashire Vital Statistics as disclosed by the last census: *Nathan* (*E.*). Substituted labour of Women, 1914–17: *Robinson* (*Mrs. A.*). British Mercantile Marine in its relation to the State: *Hill* (*Sir N.*). Capital—its rights and responsibilities: *Bell*, (*Sir H.*).

Royal Society of Arts, Journal—

March 7, 1919—Key Industries and Imperial Resources: *Duveen* (*E. J.*).

March 14, 1919—The Rubber Industry—past and present: *Porritt* (*B. D.*).

March 21, 1919—Science and Industry in Canada: *McLennan* (*Prof. J. C.*). Wage Problem in Industry: *Hichens* (*W. L.*).

Surveyors' Institution, Transactions. December, 1918, and *January*, 1919—The acquisition and valuation of land for public purposes (II and III): *Hills* (*Eustace*).

United Empire—

January, 1919—The larger relations of Climate and Crops in the United States: *Ward* (*Prof. de C.*).

February, 1919—Canada notes and comments: *Murray* (*Hon. G.*).

March, 1919—The Scowre-sea Navy: *Phita* (*Lal*).

April, 1919—Egyptian Administration: *McIlwraith* (*Sir M.*).

INDIA—

Indian Economic Society, Journal. December, 1918—The Industrial Commission and Technical Education: *Wadia* (*P. A.*). The Banking needs of India: *Tannan* (*M.L.*). The Excess Profits Tax Bill: *Vakil* (*M. H.*) Economic Thought in India: *Shah* (*D. A.*).

Wealth of India—

December, 1918—The Indian Currency Problem. International Insurance of National Debts: *Jacks* (*L. P.*).

January, 1919—A State Central Bank for India: *Bhimpure* (*B. L. V.*). India's contribution to the War: *Islington* (*Lord*).

UNITED STATES—

Actuarial Society of America, Transactions. October, 1918—An analysis of claims for total and permanent disability benefits: *Hunter* (*Arthur*). Valuations of bond holdings of a Life Insurance Company: *Johnston* (*Fred. H.*). Note on Mortality by habits representation: *Evans* (*Percy H.*). Some remarks on the War Clause: *Maclean* (*Alexander T.*). Notes on Mean Population: *Thompson* (*John S.*).

American Academy of Political and Social Science, Annals—

January, 1919—A series of articles on a Reconstruction Labor Policy.

March, 1919—A series of articles on Industries in Readjustment.

UNITED STATES—*Contd.*

American Philosophical Society, Proceedings. Vol. LVII. No. 6—Soldiers and Sailors Insurance: *Lindsey* (*S. McCune*).

American Statistical Association, Quarterly Publications. December, 1918—Our statistics of foreign commerce and the war: *Snow* (*C. D.*). Effect of grouping in graduation by osculatory interpolation: *Papps* (*P. C. H.*). A genealogical study of population: *Jones* (*C. F.*).

Health News (*Monthly Bulletin, New York State Department of Health*). *December*, 1918—Epidemic Influenza Number.

Journal of Political Economy—

January, 1919—Cartels during the War: *Notz* (*W.*). Preliminary survey of Industrial Reconstruction: *Cates* (*D.*). University Schools of Business and a new business ethics: *Wooster* (*H. A.*).

February, 1919—Food control and price-fixing in Revolutionary France (I): *Bourne* (*Henry E.*). Industrial combination and the standardization of production: *Hoyt* (*Homer*). Nature and computation of labour turnover: *Emmet* (*Boris*). Maintaining productive output; a problem in reconstruction: *Friday* (*David*).

March, 1919—Labour administration in the Shipbuilding Industry during war time (I): *Douglas* (*P. H.*) and *Wolfe* (*F. E.*). Food control and price-fixing in revolutionary France (II.): *Bourne* (*H. E.*)

Political Science Quarterly. December, 1918—The public finance of Santo Domingo: *Fairchild* (*Fred Rogers*). Limitations of the Ricardian theory of Rent (II): *Camp* (*W. R.*). The changing law of Foreign Corporations: *Powell* (*Thomas Reed*).

Quarterly Journal of Economics. February, 1919—Price-fixing as seen by a price-fixer: *Taussig* (*F. W.*). The burden of War and future generations: *Pigou* (*A. C.*). Wage theory and theories: *Devonport* (*H. J.*). The taxation of luxuries and the rate of interest: *McGoun* (*A. F.*). War Labour policies and their outcomes in peace: *Wehle* (*L.B.*). Four Labour programs: *Carver* (*T. N.*).

Yale Review. April, 1919—A national educational system: *Judd* (*C. H.*). Land tenure and public policy: *Kent* (*W.*).

EGYPT—

L'Égypte Contemporaine—

February, 1919—L'agriculture égyptienne du xviii siècle d'après les observations des savants de l'expédition française: *Audebeau* (*C.*).

March, 1919—Notes sur les défauts de l'organisation du commerce extérieur de l'Égypte: *Levi* (*D. L. G.*).

FRANCE—

Bulletin de la Statistique Générale de la France. October, 1918—Population (Recensement): sourds-muets.

FRANCE—*Contd.*

Bulletin de Statistique et de Législation Comparée—

December, 1918—La récolte des vins en Algérie en 1918 et 1917.

January, 1919—Le commerce extérieur de la France, en valeur, pendant les années 1914, 1915, 1916 et 1917. Le commerce extérieur de la France en poids pendant les années 1914, 1915, 1916, 1917. Les opérations de la Chambre de compensation des banquiers de Paris depuis 1872.

Journal des Économistes—

February, 1919—L'Allemagne et la Conférence de la Paix: *Yves-Guyot.* Les Rapports des commissions d'enquête anglaises sur l'assistance financière aux industries de guerre et à l'industrie aurifère: *Raffalovich* (*Arthur*). Effets de la guerre sur la vie économique du Chili: *Subercaseaux* (*G.*). La Bureaucratie et les bureaucrats: *Doucet* (*Robert*). Le Progrès économique de la Grèce depuis quarante ans (II.): *Andréades* (*A.*). Finances bolchéviques en 1918: *Raffalovich* (*Arthur*). La question de l'Adriatique au point de vue italien: *Cosentini* (*Fr.*).

March, 1919—La Ligue des Nations: *Yves-Guyot.* De l'amélioration des conditions matérielles de l'existence des troupes pendant la guerre, 1914–18: *Cauboue* (*Pierre*). La situation économique et financière du Japon en 1917–18: *de Nouvion* (*Georges*). L'Accroissement du prix de la vie et l'avenir de la petite épargne: *Fernand-Jacq.* Cours moyens du "stock market" de New York (graph): *the Annalist.* La Réglementation des émissions en Angleterre. Une fausse manœuvre de la bureaucratie: *Raffalovich* (*A.*). Le "Labour unrest": *Yves-Guyot.*

Journal de la Société de Statistique de Paris—

July, 1918—Meilleure utilisation des combustibles en France et en Angleterre.

February, 1919—Statistique de l'emploi des recettes des compagnies de chemins de fer: *Barriol* (*A.*). La statistique du baccalauréat, des origines (1808) à nos jours (suite et fin): *Meuriot* (*Paul*). Chronique de Demographie: *Huber* (*M.*).

La Réforme Sociale—

January, 1919—Notre situation financière sous la Restauration et l'Empire: *Falck* (*Etienne*). Mines d'or et paysans de France: *Deschamps* (*Henri*). Le Problème de la vie commune (I.): *Macaigne* (*René*).

February, 1919—Le Problème de la vie commune (II): *Macaigne* (*R.*).

March, 1919—Comment faire payer aux allemands les dommages de la guerre: *Massabuau* (*J.*). La Situation de la femme au lendemain de la guerre: *Lepelletier* (*F.*).

Revue d'Économie Politique. September to December, 1918—Depôts en banque et "Currency Notes" en Angleterre: *Withers* (*H.*). La chèque postal français: *Bolgert* (*J.*). La Banque d'Algérie; son activité générale et le renouvellement de son privilège: *Lavergne* (*B.*).

ITALY—

Giornale degli Economisti—

January, 1919—La Situazione del mercato monetario. Sul presumibile ammontare del danni di guerra: *Gini* (*Corrado*). Gli odierni aspetti dell'economia dei transporti: *Nola* (*C.*)

February, 1919—L'Imposte sulla ricchezza dopo la guerra: *Oriziotti* (*Benvenuto*). La nozione dei cosidetti-disegni pubblici: *Lolini* (*Ettore*).

Riforma Sociale. January–February, 1919—La terra ai contadini o la terra agli impiegati? *Prato* (*Giuseppe*). Cenni su alcuni aspetti delle condizioni operaie in Germania durante la guerra mondiale: *Michels* (*Roberts*).

PORTUGAL—

Boletim da Previdencia Social. May–September, 1918—Custo da vida.

SPAIN—

Revista Nacional de Economía. August–September, 1918—El derecho de huelga y el derecho de despido: *Diaz* (*P. Perez*). La poblacion y la propiedad rustica en Espana: *Barthe* (*Andres*). Plan equilibrado de estudios an la educacion comercial: *Marshall* (*L. C.*).

LIST OF ADDITIONS TO THE LIBRARY.

Since January, 1919, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

I. OFFICIAL PUBLICATIONS.

(a) United Kingdom and its several Divisions.

United Kingdom—

Army. 3 Charts giving outline history of the Organization and Movements of all the Divisions of the Army (British, Dominion and Indian) during the War. (Published by R. United Service Institution by courtesy of the Army Council and Statistical Branch of the War Office.) 1919.

Bankruptcy. 35th General Annual Report on Bankruptcy (1917), by the Board of Trade. 16 pp., fol. London, 1918. (Inspector-Gen. in Bankruptcy.)

Mines and Quarries. Fatal Accidents and Deaths in and about the Mines and Quarries during 1918. (Advance Proof, subject to correction.) 9 pp., fol. London, 1919. (Home Office.)

Liverpool: its Trade and Commerce, 1918. (Issued by the Liverpool Chamber of Commerce.) 445 pp., 4to. 1918. (Mr. J. N. Paterson.)

Board of Agriculture. Report on Agricultural conditions for the Year 1918. 4 pp., 8vo. 1919. (The Board.)

Ireland. Department of Agriculture and Technical Instruction. Produce of Crops, 1918. 3 folio sheets. Feb., 1919. (The Department.)

—— Annual Report of the Registrar-General for Ireland. Year 1917. [Cd. 9123.] 59 pp., 8vo. Dublin, 1918. (The Registrar-General.)

(b) India and Dominions.

India—

Statistics of British India. Vols. II. Financial. III. Public Health. IV. Administrative, Judicial and Local Self-Government. Calcutta, 1919.

Education. Progress of Education in India, 1912–17. (Bureau of Education, India, Seventh Quinquennial Review. Vol. I.) 215 pp., folio. Calcutta, 1918. (The Bureau.)

Production of Tea in India. Report for 1917. 29 pp., folio. Calcutta, 1919. (Department of Statistics, India.)

Trade. Review of the Trade of India in 1917–18. 82 pp., folio. Calcutta, 1919. (*Id.*)

—— Tables relating to the Trade of British India with the British Empire and Foreign Countries. 1912-13 to 1916–17. (Cmd. 48.) 198 pp., fol. London, 1919. (India Office.)

Australian Commonwealth—

Queensland. Report of the Government Statistician on Agricultural Production for the Year 1917. 36 pp., fol. Brisbane, 1918. (The Government Statistician.)

Victoria. Year Book, 1917–18. Parts: VII. Law, Crime, etc. VIII. Social Condition. 8vo. Melbourne, 1918. (*Id.*)

(b) India and Dominions—*Contd.*

Australian Commonwealth—*Contd.*

Western Australia—

Statistical Register of Western Australia for 1917-18 and Previous Years. 6 pp., 8vo. Perth, 1918. (The Registrar-General, W.A.)

Statistical Register for 1917-18. Parts II and III. Public Finance and Accumulation. VI. Industrial Establishments. VII. Mineral Statistics and Water Conservation. X. Education, Science and Art. Perth, 1918. (*Id.*)

Statistical View of Eighty-nine Years Progress, 1829 to 1917-18. 8 pp., 8vo. Perth, 1918. (*Id.*)

Canada—

Wholesale Prices. Canada, 1917. 156 pp., 8vo. Ottawa, 1919. (Department of Labour.)

Manitoba. Manitoba's Northland, including Hudson Bay Region and Rice Lake Gold Area. 52 pp., 8vo. The Pas. Man., 1918. (Commissioner of Northern Manitoba.)

New Zealand—

Census. Results of a Census of Oct. 15, 1916. Parts V. Education. VI. Infirmity. VII. Conjugal Condition. Folio. Wellington, 1918. (The Government Statistician.)

Uganda Protectorate—

Blue Book for the Year ended March 31st, 1918. 1 vol., folio. Uganda (Entebbe). (1918.) (The Chief Secretary, Uganda.)

Union of South Africa—

Department of Agriculture. Agricultural Education: 3rd Report on Cattle Feeding Experiments conducted at the Schools of Agriculture and Experiment Farms. . . . 47 pp., 8vo. Pretoria, 1918. (The Department.)

(c) Foreign Countries.

Belgium—

Mines. Annales des Mines. 1914. 1234 pp., 8vo. Brussels, 1914. (Administration des Mines.)

Brazil—

Trade. What Brazil Buys and Sells. With an Appendix on Shipping movements. 85 pp., folio. Rio de Janeiro, 1918. (Directoria de Estatistica Commercial Min. de Fazenda.)

Chile—

Anuario Estadistico. 1916. Vols. I. Demografia. II. Beneficiencia, Medicina e Higiene. III. Politica y Administracion. IV. Justicia, Policia y Criminalidad. V. Instruccion. IX. Industria Manufacturera. X XI. Comercio Interior, Exterior. XII. Comunicaciones. (Oficina Central de Estadistica.)

—— 1917. Vols. VI. Hacienda. VII. Agricultura. XI. Comercio Exterior. XII. Comunicaciones. (*Id.*)

Finland—

Housing. Recensement des Habitations de Helsingfors au 7 Decembre, 1910. *Tableaux.* 106 pp., 4to. Helsingfors, 1917. (Bureau Central de Statistique).

Land. Aperçu de la Superficie des Terres: répartition en Terres cultivées et non cultivées. 561 pp., 4to. Helsingfors, 1908. (*Id.*)

Landed Property and Buildings. Recensement des immeubles et des constructions de Helsingfors Abo, Viborg, Tammerfors, Vasa, Bjorneborg et Uleaborg; au 7 Dec., 1910. Texte et Tableaux. 2 vols., 4to. Helsingfors, 1918. (*Id.*)

(c) Foreign Countries—*Contd.*

Finland—*Contd.*

Livestock. Répartition des Principaux Animaux Domestiques et des Rennes dans les Communes rurales . . . en 1901, par rapport à des conditions analogues à l'extérieur. Par H. Paavilainden. 125 pp., 4to. Helsingfors, 1918. (*Id.*)

France—

Trade. Le Commerce de la France. Années 1916-17-18. 216 pp., 8vo. Paris, 1918. (Ministère des Finances.)

Luxemburg—

Live Stock. Recensement du Betail du 8 novembre, 1918, 23 pp., 8vo. Luxemburg, 1919. (Grd-Duché de Luxemburg: Office de Statistique.)

Netherlands—

Quelques données sociales et économiques relatives à l'année 1913–18. 11 pp., 8vo., 1919. (Bureau Central de Statistique.)

Roumania—

Roumania: some details regarding its history, growth, system of government, financial resources, commerce, &c. 15 pp., 8vo. London, 1919. (Bank of Roumania.)

Sweden—

Cost of Living. Levnadskostnaderna i Sverige 1913–14. Del II. Lokalmonografier. Stockholm. 1917. (Bureau Central de Statistique.)

Domestic Animals. Husdjursräkningen den 1 Juni 1918. 102 pp., 8vo. Stockholm, 1918. (*Id.*)

Food Consumption. Livsmedelsförbrukningen inom mindre bemedlade Hushåll. (Consumption of Food, &c., in the poorest households.) Åre 1914 and 1916. 77 pp., 8vo. Stockholm, 1917. (Centralbyrån.)

Housing. Undersokningar Ror nde de Mindre Bemedlades Bostadsförhallanden i Viss Svenska Stader. Stockholm, 1917–18. (Bureau Central.)

Public Accounts. Generalsammandrag dels over bevillningen av fast egendom samt av inkomst, &c., ar 1918. 1 sheet. Stockholm, 1919. (Bureau Central de Statistique.)

United States—

Massachusetts. Manufactures. Statistics of Manufactures for the year 1917. 129 pp., 8vo. Boston, 1919. (Massachusetts Bureau of Statistics.)

Minnesota. Labour. Department of Labour and Industries: sixteenth biennial Report. 1917–18. 187 pp., 8vo. Minneapolis, 1919. (The Department.)

New York State—

Labour. Weekly Earnings of Women in Five Industries (Paper Boxes, Shirts and Collars, Confectionery, Cigars and Tobacco, and Mercantile Establishments). 21 pp., 8vo. Albany, 1919. (State Bureau of Statistics and Information.)

—— A Plan for Shop Safety, Sanitation and Health Organization. (*Id.*)

—— A Simple and Inexpensive Respirator for Dust Protection. 10 pp., 8vo. Albany, 1918. (The Department.)

(d) International.

International Institute of Agriculture—

International Trade in Concentrated Cattle Foods. (Bureau of Statistics. No. 4. November, 1918. 72 pp. Rome, 1918. (The Institute.)

Production and Prices of Milk and of its Chief Derivatives. (Documentary Leaflets. Third Year. No. 2.) 51 pp., 8vo. Rome, February 20, 1919.) (*Id.*)

II. AUTHORS AND MISCELLANEOUS.

Allen (*J. E.*). The War Debt and how to Meet it, with an examination of the proposed Capital Levy. 150 pp., 8vo. London, 1919. (Methuen and Co.)

Balkrishna (*Professor*). Industrial Decline in India. 408 pp., 8vo. Allahabad, 1917. (The Author.)

Begg (*F. Faithfull*). How Much can Germany Pay? (Address to the London Chamber of Commerce. Jan. 14th, 1919.) 24 pp., 8vo. London, 1919. (The Author.)

Bowley (*Dr. A. L.*). The Division of the Product of Industry: an analysis of National Income before the War. 60 pp., 8vo. Oxford, 1919. (Clarendon Press.)

British Dominions Year Book, 1919. 288 pp., 8vo. London, 1919. (Eagle Star and British Dominions Insurance Co., Ltd.)

Brookmire Economic Service, Inc.: Economic Trends of War and Reconstruction, 1860–1870 (shown in graphs). 30 pp., 8vo. New York, 1918. (Brookmire Economic Service.)

Chabot (*Gebroeders*). Tableaux Graphiques donnant les cours de Change (Francs, Sterling, et Marcs) depuis le commencement de la guerre jusqu'au 31, decembre 1918. (Rotterdam Exchange.) 3 sheets folio. Rotterdam, 1919. (The Compilers.)

Chapman (*Capt. E. R.*). The Annual Symmetrical Variation of Certain Elements and a Note on the Choice of Seasons. 51 pp., 8vo. London, 1919. (The Author.)

Columbia University Studies in History, Economics, and Public Law. Vol. lxxxi. No. 2. Whole No. 189. Australian Social Development. By *Clarence H. Northcott*. 300 pp., 8vo. New York, 1918. (P. S. King and Son.)

Damaschke (*A.*). Edited by—

Jahrbuch der Bodenreform. (Vierteljahrshefte) 1905, 1906, 1907, 1908, 1909, 1910 (Vols. i-vi). 6 vols., 8vo. Jena, 1905–10. (United Committee for the Taxation of Land Values.)

Deutsche Volksstimme (Organ der Deutschen Bodenreformer) 1897–1909. 13 vols., 8vo. Berlin, 1897, etc. (*Id.*)

Davenport (*E. H.*). Parliament and the Taxpayer. Introduction by H. Samuel. 219 pp., 8vo. 1919. (Skeffington.)

Drew (*A. N.*). Russia: A study, social and industrial. 188 pp., 8vo. London, 1918. (Simpkin Marshall.)

Foxwell (*H. S.*). Papers on Current Finance. 280 pp., 8vo. London, 1919. (Macmillan and Co.)

Garton Foundation. Industrial Situation after the War (Memorandum on the). Revised and enlarged edition. 175 pp., 8vo. London, 1919. (Harrison and Sons.)

—— Another copy. (Lt.-Col. the Hon. M. V. Brett, M.V.O., see. Garton Foundation.)

Gray (*Howard L.*). War Time Control of Industry; the experience of England. 307 pp., 8vo. New York, 1918. (The Macmillan Co.)

Hecht (*J. S.*)—

The Real Cause of Strikes and how to prevent them. 8 pp.

How Germany can and shall pay her Debt in full. (The Author.)

Reconstruction and Key Industries. 16 pp., 8vo. Bradford and London. n.d. (The Author.)

Insolera (*F.*). Sulla Misura dell'aumento di Mortalità per effetto indiretto della Guerra. (Reprint.) 9 pp., 8vo. Roma, 1919. (The Author.)

Isserlis (*L.*)—

On a Formula for the Product Moment Coefficient of any order of a normal Frequency Distribution in any Number of Variables (from Biometrika). 6 pp., 4to. London, 1918. (The Author.)

Formulae for determining the Mean Values of Products of Deviations of Mixed Moment Coefficients in two to eight Variables in samples taken from a limited Population (from Biometrika, Nov. 28, 1918). 1½ pp., 4to. London, 1918. (The Author.)

II. Authors and Miscellaneous—*Contd.*

Jordan (*Wm. Leighton*). On Payment of the National Debt: four letters addressed to a Statesman. 7 pp., 8vo. London, 1919. (The Author.)

Kenyon (*Frederic G.*). Education: Secondary and University. A report of conferences between the Council for humanistic studies and the Conjoint Board of Scientific Societies. 47 pp., 8vo. London, 1919. (John Murray.)

King Edward's Hospital Fund for London. Pensions for Hospital Officers and Staffs: Report of a Sub-Committee of the Executive Committee. 273 pp., fol. London, 1919. (The Chairman.)

Kitchin (*Joseph*). Trade Cycles Chart, 1796–1913, with Figures and Authorities: showing Bank Deposits, Dividends of 118 large Companies, Fixed Interest Stocks, Prices of Commodities, Discount Rate, Marriages, Employment, Wages, "Real" Wages, Taxpayers Incomes, "Real" Incomes, "Real" Trade, "Real" London Bankers Clearings, Pig Iron, Shipbuilding under Construction, Stock of Gold Money, Annual Gold Production. 2 sheets. 1919. (The Author.)

Kitson (*Arthur*). A Criticism of the First Interim Report of the Committee on Currency and Foreign Exchange, presided over by Lord Cunliffe, G.B.E. 12 pp., fol. London, 1919. Price 1*s.* (British Banking Reform League.)

La Salle Extension University. The Traffic Field. (Various Authors.) 299 pp., 8vo. Chicago, 1919. (The University.)

Lehfeldt (*R. A.*). Gold Prices and the Witwatersrand. 130 pp., 8vo. London, 1919. (P. S. King and Son, Ltd.)

Maroi (*Lanfranco*)—

La Proprieta Terriera e il Debito Ipotecario. (Reprint.) 34 pp., Roma, 1918. (The Author.)

Come si calcola e a quanto ammonta la ricchezza d'Italia e delle altre principali nazioni. 37 pp., 4to. (*Id.*)

Mersey Docks and Harbour Board. Accounts for the Year ending July 1st, 1918. 24 pp., fol. Liverpool, 1918. (The Board.)

Messina (*Ignazio*). Intorno a un Nuovo Teorema di Calcolo delle Probabilità. (Reprint.) 20 pp., 4to. Roma, 1918.

Mortara (*Giorgio*). Elementi di Statistica. 413 pp., 8vo. Rome, 1917. (Soc. Anonima Tipografica Leonardo da Vinci. Citta di Castello. Perugia.)

Musée Social. Mémoires et Documents, 1919. No. 2. Les Problèmes économiques et sociaux de l'Alsace-Lorraine. Jean Brunhes. 13 pp., 8vo. Paris, 1919 (Musée Social.)

—— Memoires et Documents 3. 1919. Union Necessaire entre la Production Coloniale et l'Industrie métropolitaine: La Production Cotonnière. Jean Dybowski. 33 pp., 8vo. Paris, 1919. (*Id.*)

Penty (*Arthur J.*). Guilds and the Social Crisis. 103 pp., 8vo. London, 1919. (G. Allen and Unwin, Ltd.)

Pierson (*Lewis E.*). Business Problems of Reconstruction. 23 pp., 8vo. New York, 1919. (Irving National Bank.)

Railway Reorganisation. A study of possibilities of staff reorganisation and economical working, with a tabular analysis of all British railway costs based on Board of Trade returns for the year 1913; and appendices dealing with flat rates, utilisation of railway rolling stock, and average haul of merchandise and minerals. By a Railway Officer. 108 pp., 8vo. London, 1919. (E. and F. N. Spon, Ltd.)

Rawlley (*Ratan C.*). The Silk Industry and Trade: a study in the Economic Organisation of the Export Trade of Kashmir and Indian Silks, with special reference to their utilisation in the British and French Markets. 172 pp., 8vo. London, 1919. (P. S. King and Son, Ltd.)

Robinson (*Cyril E.*). New Fallacies of Midas. Introduction by Sir George Paish. 289 pp., 8vo. London, 1919. (Headley Bros., Ltd.)

Ross (*C. Edmonstone*). Period Computation: a simple ready reckoner for rapidly calculating (1) the number of weeks and days between any dates whether in the same or different years; (2) the maturity date of any Bill; (3) the day of the week of any date in the Nineteenth or Twentieth Century. 11 pp., 8vo. London, 1919. (Watts and Co.)

II. Authors and Miscellaneous—*Contd.*

Sanchez de Fuentes (*Fernando*). Discursos. (Por la Libertad y el Derecho.) 69 pp., 8vo. Habana, 1918. (Republ. de Cuba: Propaganda por la Guerra.)

Sheffield (*Lord*). Imperial Preference: an examination of proposals made for its establishment made on behalf of the Government of Mr. Lloyd George. 35 pp., 8vo. London, 1919. (The Cobden Club.)

Smith-Gordon (*Lionel*). Co-operation for Farmers. 247 pp., 8vo. London, 1918. (Williams and Norgate.)

Soward (*Sir A. W.*) and *Willan* (*W. E.*). The Taxation of Capital. 408 pp., 8vo. London, 1919. (Waterlow and Sons, Ltd.)

Springer (*L.*). Financial and Commercial After-War Conditions. 118 pp., 8vo. London, 1919. (The Author.)

Suarez (*Vicente Pardo*). Ladrones de Tierras. 324 pp., 8vo. Habana, 1918. (Republ. de Cuba: Propaganda por la Guerra.)

West (*Carl J.*). Introduction to Mathematical Statistics. 150 pp., 8vo. Columbus, Ohio, 1918. (R. G. Adams and Co., Ohio.)

Willoughby (*William Franklin*). The Problem of a National Budget. (Institute for Government Research: Studies in Administration.) 219 pp., 8vo. New York and London, 1918. (D. Appleton and Co.)

Woolf (*Leonard S.*). Co-operation and the Future of Industry. 141 pp., 8vo. London, 1918. (George Allen and Unwin, Ltd.)

Zorn (*John*)—

Thoughts on Taxation arising out of the Tariff Question (with a diagram illustrating cost to consumer of home-produced and imported goods. 27 pp., 4to. London, 1906. (The Author.)

The Incidence of the Income Tax. 55 pp., 8vo. London, 1909. (*Id.*)

Thoughts on a Capital Levy. 14 pp., 8vo. (Privately printed). (*Id.*)

PERIODICAL RETURNS.

REGISTRATION OF THE UNITED KINGDOM.

No. I.—ENGLAND AND WALES.

MARRIAGES, BIRTHS AND DEATHS—To 31st December, 1918

A.—*Serial Table of* Marriages, Births, *and* Deaths, *returned in the Years* 1918-1912, *and in the* Quarters *of those Years.*

Calendar Years, 1918-1912:—*Numbers.*

Years.........	1918.*	'17.*	'16.	'15.	'14.	'13.	'12.
Marriages No.	286,807	258,360	279,846	360,885	294,401	286,583	283,834
Births........ ,,	662,773	668,340	785,520	814,614	879,096	881,890	872,737
Deaths .... ,,	611,991	498,955	508,217	562,253	516,742	504,975	486,939

Quarters *of each Calendar Year*, 1918-1912.

(I.) Marriages:—*Numbers.*

Qrs. ended last day of	1918.	'17.	'16.	'15.	'14.	'13.	'12.
March........ No.	65,658	50,675	67,952	55,472	51,046	60,926	44,737
June .... ,,	67,120	63,763	74,550	97,220	81,312	65,904	74,619
September ,,	78,975	69,639	67,477	102,671	82,048	83,636	83,505
December ,,	75,054	74,283	69,867	105,522	79,995	76,117	80,973

(II.) Births:—*Numbers.*

Qrs. ended last day of	1918.	'17.	'16.	'15.	'14.	'13.	'12.
March........ No.	162,308	178,725	194,965	221,523	217,414	216,629	222,600
June .... ,,	170,239	173,418	209,006	213,109	226,152	227,470	218,070
September ,,	168,451	162,526	198,307	196,501	227,238	225,501	219,232
December ,,	161,775	153,671	183,242	183,481	208,292	212,290	212,835

(III.) Deaths:—*Numbers.*

Qrs. ended last day of	1918.	'17.	'16.	'15.	'14.	'13.	'12.
March........ No.	138,005	163,919	142,983	177,243	146,193	146,541	144,642
June .... ,,	118,550	127,704	126,534	138,575	124,128	121,743	115,777
September ,,	114,218	94,591	102,435	109,406	115,535	113,446	101,680
December ,,	241,218	112,741	136,265	137,029	130,886	123,245	124,840

* Provisional.

Annual Rates of MARRIAGES, BIRTHS, *and* DEATHS, *per* 1,000 PERSONS LIVING *in the Years* 1917-1910, *and in the* QUARTERS *of those Years.*

Calendar YEARS, 1917-1910:—*General Ratios.*

YEARS	1917.	'16.	'15.	14.	'13	'12.	'11.	'10.
Estmtd. Popln. of England and Wales *in thousands* in middle of each Year*	*33,711,	34,500,*	35,359,*	36,961,	36,606,	36,382,	36,190,	35,792,
Persons Married	13·8†	14·9†	19·4†	15·9	15·7	15·6	15·2	15·0
Births	17·8†	20·9†	21·9†	23·8	24·1	23·9	24·3	25·1
Deaths................	14·1*	14·4*	15·7*	14·0	13·8	13·3	14·6	13·5

QUARTERS *of each Calendar Year,* 1917-1910.

(I.) PERSONS MARRIED:—*Ratio per* 1,000.

Qrs. ended last day of	1917.	'16.	'15.	'14.	'13.	'12.	'11.	'10.
March	10·9†	14·5†	12·1†	11·2	13·5	9·9	10·0	12·8
June..................	13·6†	15·9†	20·9†	17·6	14·4	16·5	16·8	13·7
September	14·7†	14·3†	21·9†	17·6	18·1	18·2	17·1	17·0
December	15·7†	14·8†	22·5†	17·2	16·5	17·7	16·8	16·3

(II.) BIRTHS:—*Ratio per* 1,000.

Qrs. ended last day of	1917.	'16.	'15.	'14.	'13.	'12.	'11.	'10.
March	19·3†	20·8†	24·1†	23·9	24·0	24·5	25·1	25·1
June..................	18·5†	22·3†	22·9†	24·5	24·9	24·0	25·0	26·3
September	17·2†	21·0†	20·9†	24·4	24·4	23·9	24·4	25·2
December	16·2†	19·4†	19·5†	22·4	23·0	23·2	22·9	23·6

(III.) DEATHS:—*Ratio per* 1,000.

Qrs. ended last day of	1917.	'16.	'15.	'14.	'13.	'12.	'11.	'10.
March	19·3*	16·4*	20·1*	16·0	16·2	15·9	16·0	15·5
June..................	14·8*	14·4*	15·4*	13·5	13·3	12·8	13·3	13·0
September	10·9*	11·4*	12·1*	12·4	12·3	11·1	15·5	11·5
December	13·0*	15·3*	15·1*	14·0	13·4	13·6	13·6	14·1

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* Civilians only.

† Based upon total populations specially estimated for this purpose.

B.—*Special Town Table:*—POPULATION; BIRTH-RATE *and Civilian* DEATH-RATE *in each Quarter of* 1918, *in certain of the* NINETY-SIX *Large Towns.*

Cities and boroughs.	Estimated Civil population middle of 1917.	Annual Rate to 1,000 Living during the thirteen weeks ending							
		March 30, 1918. (1st quarter.)		June 29, 1918. (2nd quarter.)		Sept. 28, 1918. (3rd quarter.)		Dec. 28, 1918. (4th quarter.)	
		Births.	Deaths.	Births.	Deaths.	Births.	Deaths.	Births.	Deaths.
Ninety-six towns	16,545,401	18·0	17·1	18·0	14·0	17·5	13·3	17·0	27·5
Including—									
London	4,026,901	17·1	18·6	16·5	14·2	15·7	12·3	15·8	29·2
West Ham	271,934	21·2	18·3	20·9	14·2	18·8	14·1	19·8	33·6
Croydon	167,681	13·4	15·0	14·8	11·6	13·9	10·0	14·0	24·1
Brighton	113,635	15·7	18·1	18·5	14·3	16·2	12·7	15·5	28·5
Portsmouth	198,527	21·4	17·0	22·6	13·0	22·4	12·9	20·2	26·8
Bristol	334,814	16·7	15·5	16·4	13·1	16·9	11·7	15·6	26·9
Cardiff	169,440	20·9	16·3	21·6	12·6	19·1	13·4	18·8	27·0
Swansea................	111,776	19·0	16·9	21·2	12·3	19·9	11·0	18·9	24·3
Wolverhampton	93,037	19·8	14·9	20·6	11·5	20·3	11·6	19·8	33·8
Birmingham	870,211	19·1	14·4	18·6	11·6	18·1	11·8	16·2	21·9
Norwich	109,877	16·2	21·7	15·2	13·8	14·9	11·0	16·2	29·4
Leicester	212,433	14·7	15·7	15·1	12·8	13·7	12·5	12·3	30·9
Nottingham	236,853	15·7	17·0	16·6	13·2	16·5	14·9	15·4	38·6
Derby	119,191	16·9	14·2	17·5	11·9	17·6	11·7	18·4	25·3
Birkenhead	133,819	20·9	16·0	22·3	14·7	22·3	14·0	19·5	32·3
Liverpool	716,140	22·1	20·9	22·0	18·2	22·1	16·6	20·0	28·4
Bolton	163,411	15·4	17·9	15·1	14·5	15·2	13·9	14·3	21·3
Manchester	660,143	17·9	18·1	18·5	14·4	17·8	14·0	17·6	25·3
Salford	211,373	17·8	16·0	18·1	14·4	17·1	15·7	17·5	22·4
Oldham	133,721	14·9	20·4	14·2	16·0	13·1	16·1	13·0	30·1
Burnley................	93,779	12·5	19·8	14·3	14·2	14·4	14·8	14·5	22·8
Blackburn............	113,315	11·4	18·7	12·7	15·0	12·6	15·8	12·5	25·8
Preston	106,747	16·7	16·1	17·0	12·8	15·4	15·3	16·3	28·1
Huddersfield	105,818	14·6	15·1	11·8	15·1	13·7	16·0	13·5	18·9
Halifax	92,775	13·9	20·0	13·0	15·2	11·8	14·7	12·6	28·2
Bradford	266,338	13·5	16·1	13·0	17·4	14·1	14·6	12·3	24·7
Leeds....................	417,051	16·6	20·3	16·0	16·1	17·3	14·4	15·8	30·0
Sheffield	469,293	21·5	16·9	20·6	14·8	20·9	14·8	19·7	35·5
Hull	246,357	20·9	17·1	18·4	18·6	19·8	15·4	19·1	34·9
Sunderland	141,765	21·9	18·7	24·2	19·8	25·1	21·4	24·6	37·3
Gateshead............	119,134	22·1	17·8	25·6	15·5	25·0	17·5	21·7	25·8
Newcastle-on-Tyne	266,551	22·0	16·2	22·5	14·7	21·4	15·5	22·5	23·1

Note.—The 96 great towns are those with populations exceeding 50,000 persons at the Census of 1911. The birth-rates are based upon births actually registered in the several towns and upon total populations estimated to the middle of 1917. The death-rates are based upon civilian deaths and upon the estimated civilian population in 1917. The death-rate in London has been corrected as far as possible (1) by excluding deaths of all non-residents, and (2) by including the deaths of London residents occurring in the Metropolitan outer ring or in Metropolitan public institutions situated outside the County. The death-rates in the other towns have been corrected as far as possible (1) by the exclusion of all deaths of non-residents, and (2) by the inclusion of deaths of residents in certain outlying public institutions. With regard to the outer ring and its constituent areas, however, correction is more complete, a distribution of all transferable deaths occurring in any part of Greater London having been made.

No. II.—SCOTLAND.

BIRTHS, DEATHS, AND MARRIAGES, IN THE YEAR ENDED 31ST DECEMBER, 1918.

I.—*Serial Table:—Number of* BIRTHS, DEATHS, *and* MARRIAGES *in Scotland, and their Proportion to the Population estimated to the Middle of each Year, during each Quarter of the Years* **1918-1914** *inclusive.*

	1918.		1917.		1916.		1915.		1914.	
	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.	Number.	Per 1,000.
1st Quarter—										
Births	23,227	19·3	25,373	21·2	27,352	22·8	30,999	26·3	30,656	26·3
Deaths	17,881	14·9	21,787	18·2	19,508	16·3	24,990	21·2	20,654	17·7
Marriages ..	8,240	6·8	7,260	6·1	8,604	7·2	7,996	6·8	8,631	7·4
2nd Quarter—										
Births	26,051	21·4	26,199	21·6	29,931	25·0	30,793	25·8	33,009	28·0
Deaths	16,675	13·7	18,617	15·3	18,272	15·2	20,413	17·1	18,169	15·4
Marriages ..	8,042	6·6	7,334	6·0	7,636	6·4	9,245	7·8	9,088	7·7
3rd Quarter—										
Births	24,695	20·1	23,113	18·8	27,144	22·4	26,804	22·2	30,336	25·5
Deaths	15,183	12·3	13,729	11·2	15,026	12·4	15,932	13·2	16,219	13·6
Marriages ..	9,402	7·6	7,827	6·4	7,766	6·4	9,645	8·0	9,358	7·9
4th Quarter—										
Births	24,577	20·0	22,797	18·6	25,515	21·0	25,585	21·2	29,933	25·1
Deaths	28,620	23·3	15,348	12·5	17,834	14·7	20,296	16·8	18,515	15·5
Marriages ..	8,910	7·2	8,065	6·6	7,477	6·2	9,386	7·8	7,972	6·7
Year—										
Population.	4,886,300		4,854,738		4,824,308		4,785,598		4,747,167	
Births	98,550	20·2	97,482	20·1	109,942	22·8	114,181	23·9	123,934	26·1
Deaths	78,359	16·0	69,481	14·3	70,640	14·6	81,631	17·1	73,557	15·5
Marriages ..	34,594	7·1	30,486	6·3	31,483	6·5	36,272	7·6	35,049	7·4

II.—*Special Average Table:—Number of Births, Deaths, and Marriages in Scotland and in the divisions of the counties during each Quarter of* **1918**, *and their proportion to the population.*

Registration group of districts.	Total Births.		Deaths.		Marriages.	
	Number.	Per 1,000 of population.	Number.	Per 1,000 of population.	Number.	Per 1,000 of population.
1*st Quarter*—SCOTLAND	23,227	19·3	17,881	14·9	8,240	6·8
Northern division ...	358	15·0	415	17·4	120	5·0
North Western div....	611	16·3	633	16·9	223	6·0
North Eastern div.	2,039	18·4	1,583	14·3	698	6·3
East Midland div.	2,940	16·6	2,706	15·3	1,053	5·9
West Midland div.	1,803	18·6	1,319	13·6	453	4·7
South Western div.....	11,796	22·0	7,950	14·8	4,039	7·5
South Eastern div.	2,937	16·5	2,334	13·1	1,391	7·8
Southern div.	743	16·9	743	16·9	263	6·0
2*nd Quarter*—SCOTLAND	26,051	21·4	16,675	13·7	8,042	6·6
Northern division	355	14·7	399	16·6	118	4·9
North Western div.....	614	16·2	554	14·6	196	5·2
North Eastern div. ...	2,124	18·9	1,503	13·4	698	6·2
East Midland div.	3,306	18·4	2,321	13·0	980	5·5
West Midland div. ...	2,087	21·3	1,199	12·2	465	4·7
South Western div.....	13,280	24·5	7,585	14·0	3,924	7·2
South Eastern div. ...	3,399	18·9	2,179	12·1	1,345	7·5
Southern div.	886	19·9	653	14·7	316	7·1
3*rd Quarter*—SCOTLAND	24,695	20·1	15,183	12·3	9,402	7·6
Northern division	373	15·3	295	12·1	120	4·9
North Western div.....	664	17·4	485	12·7	207	5·4
North Eastern div.	2,077	18·3	1,308	11·5	744	6·6
East Midland div.	3,139	17·3	2,243	12·4	1,141	6·3
West Midland div.	2,040	20·6	1,102	11·1	564	5·7
South Western div.....	12,204	22·3	6,786	12·4	4,694	8·6
South Eastern div.	3,302	18·2	2,112	11·6	1,615	8·9
Southern div.	896	20·0	588	13·1	317	7·1
4*th Quarter*—SCOTLAND	24,577	20·0	28,620	23·3	8,910	7·2
Northern division	382	15·7	532	21·9	129	5·3
North Western div....	621	16·2	936	24·5	211	5·5
North Eastern div. ...	2,151	19·0	2,559	22·6	941	8·3
East Midland div.	3,238	17·9	4,257	23·5	1,186	6·5
West Midland div.....	1,883	19·0	2,092	21·1	522	5·3
South Western div.....	12,188	22·2	12,182	22·2	4,111	7·5
South Eastern div.	3,276	18·0	4,281	23·5	1,486	8·2
Southern div.	838	18·7	1,181	26·3	324	7·2

Population of Scotland.

Population.	Scotland.	Northern division.	North Western division.	North Eastern division.	East Midland division.	West Midland division.	South Western division.	South Eastern division.	Southern division.
By Census of 1911	4,760,904	105,997	164,636	467,333	712,146	386,312	2,033,521	700,577	190,382
Estimated to middle of 1918	4,882,900	96,600	151,800	449,700	718,800	392,700	2,173,800	721,300	178,200

No. III.—IRELAND.

IRELAND.—*Number of Births, Deaths and Marriages in each Province for each Quarter of* 1918 *and their Proportion to the Population.*

Provinces.	Births.		Deaths.		Marriages.*	
	Number.	Annual rate per 1,000 of population.	Number.	Annual rate per 1,000 of population.	Number.	Annual rate per 1,000 of population.
1st quarter—						
Leinster	5,637	19·4	5,226	18·0	1,523	5·2
Munster	4,906	19·0	3,989	15·4	949	3·7
Ulster	7,666	19·4	7,066	17·9	2,305	5·8
Connaught	2,907	19·0	2,078	13·6	350	2·3
Ireland	21,116	19·5	18,359	16·9	5,127	4·7
2nd quarter—						
Leinster	6,344	21·8	5,172	17·8	1,329	4·6
Munster	5,502	21·3	3,878	15·0	1,783	6·9
Ulster	8,986	22·7	7,175	18·1	2,055	5·2
Connaught	3,018	19·7	2,046	13·4	690	4·5
Ireland	23,850	22·0	18,271	16·9	5,857	5·4
3rd quarter—						
Leinster	6,279	21·6	4,432	15·3	1,788	6·2
Munster	5,163	19·9	3,333	12·9	1,143	4·4
Ulster	8,271	20·9	5,993	15·2	2,229	5·6
Connaught	2,878	18.8	1,647	10·8	525	3·4
Ireland	22,591	20·8	15,405	14·2	5,685	5·2
4th quarter—						
Leinster	5,565	19·2	8,643	29·8	1,809	6·2
Munster	4,337	16·8	5,253	20·3	1,164	4·5
Ulster	7,551	19·1	10,432	26·4	2,416	6·1
Connaught	2,553	16·7	2,322	15·2	436	2·9
Ireland	20,006	18·5	26,650	24·6	5,825	5·4
Total	87,563	20·2	78,685	18·1	22,494	5·2

* For the preceding quarter.

Population of Ireland.

	Leinster.	Munster.	Ulster.	Connaught.	Ireland.
By census of 1911	1,162,044	1,035,495	1,581,696	610,984	4,390,219
Estimated to middle of 1918	—	—	—	—	4,337,000

IRELAND

	Births.		Deaths.		Marriages.*	
	Number.	Annual rate per 1,000 persons.	Number.	Annual rate per 1,000 persons.	Number.	Annual rate per 1,000 persons.
1st quarter, 1918—						
Total rural districts	13,381	18·1	11,625	15·7	—	
Total urban districts	7,735	21·7	6,734	18·9	—	
Dublin co. borough	2,010	—	1,783	—	582	
Belfast co. borough	2,207	—	2,631	—	884	
2nd quarter—						
Total rural districts	15,249	20·6	11,556	15·6	—	
Total urban districts	8,601	24·1	6,715	18·8	—	
Dublin co. borough	2,229	—	1,740	—	443	
Belfast co. borough	2,544	—	2,175	—	732	
3rd quarter—						
Total rural districts	14,145	19·1	9,098	12·3	—	
Total urban districts	8,446	23·6	6,307	17·7	—	
Dublin co. borough	2,284	—	1,779	—	638	
Belfast co. borough	2,458	—	1,731	—	783	
4th quarter—						
Total rural districts	12,630	17·1	15,769	21·3	—	
Total urban districts	7,376	20·7	10,881	30·5	—	
Dublin co. borough	1,906	—	3,026	—	654	
Belfast co. borough	2,209	—	2,959	—	949	

* For the preceding quarter.

No. IV.—GREAT BRITAIN AND IRELAND.

SUMMARY *of* MARRIAGES, *in the Year ended* 30*th September*, **1918**; *and of* BIRTHS *and* DEATHS, *in the Year ended* 31*st December*, **1918**.

(Compiled from the Quarterly Returns of the respective Registrars-General.)

Countries.	[000's omitted] Area in statute acres.	Population middle estimated.	Marriages.	Per 1,000 of population.	Births.	Per 1,000 of population.	Deaths.	Per 1,000 of population.
		No.	No.	Ratio.	No.	Ratio.	No.	Ratio.
England and Wales	37,338,		286,036		662,773		611,991	
Scotland	19,070,		33,749		98,550		78,359	
Ireland	20,345,		22,494		87,563		78,685	
GreatBritain and Ireland	76,753,		342,279		848,886		769,035	

Trade of United Kingdom, for the Years 1913-1918.—*Declared Value of the Total Exports of* **Foreign** *and* **Colonial** *Produce and Manufactures from the United Kingdom to each Foreign Country and British Possession.*

Merchandise Exported to the following Foreign Countries, &c.	[000's omitted.] 1918.	1917.	1916.	1915.	1914.	1913.
	£	£	£	£	£	£
Russia	10,	4,008,	9,375,	11,472,	7,351,	9,589,
Sweden and Norway	331,	1,164,	3,703,	5,938,	2,016,	1,529,
Denmark*	241,	834,	2,824,	4,148,	1,364,	586,
Germany†	—	—	—	—	13,347,	19,878,
Holland†	373,	3,977,	8,932,	12,425,	7,309,	5,128,
Java	23,	39,	146,	132,	44,	46,
Belgium	1,	45,	16,	46,	4,973,	7,405,
France†	13,691,	16,353,	14,772,	12,604,	9,274,	11,920,
Portugal†	298,	902,	916,	830,	545,	662,
Spain†	281,	791,	1,663,	1,265,	766,	763,
Italy†	4,249,	4,134,	3,537,	3,690,	1,044,	1,014,
Austria-Hungary	—	—	—	—	761,	1,304,
Greece	25,	5,	61,	175,	66,	59,
Roumania	—	4,	3,	8,	51,	71,
Turkey (European and Asiatic) and Crete	—	10,	25,	52,	103,	250,
Philippine Islands and Guam	2,	8,	26,	25,	54,	61,
China ‡	84,	68,	157,	79,	123,	168,
Japan §	1,358,	324,	468,	300,	206,	296,
United States	3,478,	26,942,	31,898,	29,375,	29,992,	30,239,
Peru	7,	39,	74,	55,	78,	105,
Chile	45,	96,	340,	229,	254,	357,
Brazil	116,	209,	395,	427,	338,	555,
Argentine Republic	123,	434,	650,	596,	504,	803,
Other countries	1,136,	1,671,	3,176,	2,794,	2,476,	3,129,
Total to Foreign Countries	25,872,	62,060,	83,157,	86,665,	83,039,	95,917,
BRITISH POSSESSIONS.						
Channel Islands	461,	390,	411,	342,	272,	251,
Egypt	183,	—	—	—	177,	160,
Nigerian Protectorate	84,	248,	300,	—	275,	219,
Cape of Good Hope	311,	521,	885,	852,	821,	957,
Brit. India (including Burmah)	445,	750,	1,578,	1,047,	950,	1,423,
Straits Settlements (including Malay States)	61,	59,	271,	158,	126,	214,
Ceylon	21,	56,	150,	113,	116,	131,
Australia	1,816,	1,899,	3,159,	2,902,	3,447,	3,370,
New Zealand	293,	356,	834,	754,	1,001,	943,
Canada	643,	1,599,	3,553,	2,743,	3,124,	3,511,
British West Indies (including Bahamas)	58,	151,	241,	406,	386,	394,
Other Possessions	708,	1,464,	2,969,	2,815,	1,756,	2,166,
Total to British Possessions	5,084,	7,493,	14,451,	12,132,	12,451,	13,739,
Total to Foreign Countries and British Possessions	30,956,	69,553,	97,608,	98,797,	95,490,	109,656,

* Including Faröe Islands, Iceland and Greenland. † Excluding Colonies.

‡ Excluding Hong Kong, Wei-hai-Wei and Macão. § Including Formosa.

Trade of United Kingdom, 1918-1917-1916.—*Declared Real Value (Ex-duty) of* **Imports** *at Port of Entry, and therefore including Freight and Importer's Profit; and the Distribution of* **Exports** *of British and Irish Produce and Manufactures from the United Kingdom, according to their Declared Real Value.*

Merchandise (*excluding Gold and Silver*) Imported from, and Exported to, the following Foreign Countries, &c.	[000's omitted.]					
	1918.		1917.		1916.	
	Imports from	*Exports to*	Imports from	*Exports to*	Imports from	*Exports to*
	£	£	£	£	£	£
Russia	6,730,	298,	17,937,	46,733,	18,252,	24,978,
Sweden	22,375,	2,628,	14,815,	3,089,	20,606,	6,574,
Norway	23,763,	5,437,	18,424,	8,480,	16,659,	10,897,
Denmark*	4,470,	3,379,	17,751,	6,908,	21,942,	11,443,
Germany†	8,	—	47,	—	103,	—
Holland	7,692,	14,986,	20,032,	20,822,	22,139,	24,057,
Java	5,764,	5,831,	13,249,	6,043,	14,318,	7,109,
Belgium†	200,	76,	333,	252,	1,291,	254,
France†	35,040,	128,054,	22,868,	111,507,	26,585,	92,830,
Portugal†	10,060,	3,741,	3,882,	3,129,	5,251,	4,098,
Spain†	30,697,	3,869,	22,151,	4,792,	25,034,	8,523,
Italy†	18,413,	29,270,	10,397,	27,664,	11,243,	20,453,
Austria-Hungary	—	—	—	—	7,	—
Greece	2,392,	1,048,	956,	183,	4,687,	1,265,
Roumania	—	—	—	702,	—	46,
Turkey and Crete	30,	510,	472,	949,	898,	434,
Philippine Islands and Guam	6,082,	562,	3,806,	492,	3,987,	491,
China‡	9,708,	11,832,	8,499,	10,621,	8,335,	10,707,
Japan§	23,883,	6,015,	15,310,	5,523,	12,494,	7,487,
United States	515,979,	22,944,	376,472,	33,251,	291,835,	32,688,
Peru	8,006,	1,530,	4,675,	1,488,	4,789,	1,081,
Chile	19,334,	6,384,	13,291,	4,634,	12,409,	4,034,
Brazil	8,850,	8,836,	9,951,	7,186,	9,037,	6,718,
Argentine Republic	63,116,	17,613,	48,514,	12,881,	51,594,	13,949,
Other countries	71,727,	45,117,	60,554,	35,358,	62,333,	29,988,
Total—Foreign Countries	894,319,	319,960,	705,386,	352,687,	645,833,	320,104,
BRITISH POSSESSIONS.						
Channel Isles	3,719,	1,839,	2,923,	1,611,	2,496,	1,689,
Egypt	54,149,	22,235,	32,472,	14,778,	26,606,	11,225,
Nigerian Protectorate	13,631,	4,856,	9,311,	4,146,	7,442,	3,324,
Cape of Good Hope	8,065,	10,251,	6,378,	8,401,	7,753,	9,367,
British India (including Burmah)	88,900,	49,174,	66,847,	59,962,	72,366,	52,788,
Straits Settlements	12,951,	6,853,	23,043,	5,626,	22,299,	6,032,
Ceylon	12,160,	1,965,	10,199,	2,097,	10,730,	2,746,
Australia	45,696,	26,217,	64,430,	22,119,	36,178,	35,947,
New Zealand	24,812,	7,706,	29,256,	7,039,	31,627,	12,073,
Canada	124,468,	14,280,	84,331,	16,210,	58,529,	18,018,
British West Indies (including Bahamas)	8,131,	1,711,	6,283,	2,082,	5,062	2,178,
Other Possessions	28,337,	31,426,	24,397,	28,548,	21,686,	30,788,
Total—British Possessions	425,019,	178,513,	359,872,	172,619,	302,674,	186,175,
Total — Foreign Countries and British Possessions	1,319,339	498,473,	1,065,258	525,306,	948,507,	506,279,

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* Including Faröe Islands.
† Excluding Colonies.
‡ Excluding Hong Kong, Macão and Wei-hai-Wei.
§ Including Formosa.

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A SURVEY OF THE DEVELOPMENT OF THE SERBIAN (SOUTHERN SLAV) NATION.

AN ECONOMIC AND STATISTICAL STUDY.

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[Read before the Royal Statistical Society, March 18, 1919, the President, the Right Hon. HERBERT SAMUEL, in the Chair.]

WE should like to give a brief survey of the economic development of the Serbian people, and to do this we must examine the development of the Serbian race, as a whole, and not confine our attention to the frontiers of the Serbian State. In fact, Serbia included within her frontiers but a small part of the Serbian race; nevertheless, she represented the ideal of free national development for the whole of the Serbian race. Her political frontiers depended, of course, on the possibility of the moment of carrying out her national aims, and as this was governed by the exigencies of the political situation, at different periods in her history Serbia had different frontiers—in 1830, in 1878, in 1913—and to-day they must be national frontiers determined by the whole Serbian race, which has at last achieved its unity.

To understand the full significance of the statistical documents herein quoted, and on which this study is based, the economic development of the Southern Slav race must be considered from the historical point of view.

The Southern Slavs settled in the centre and west of the Balkan Peninsula. On their arrival they were a cattle-raising population. The sparsely inhabited territories they occupied and the natural riches of forest and pasture rendered any other form of economic life unnecessary for the time being. Foreign trade in cattle, and some animal products, were quite enough in those days to provide the very few economic commodities which the people needed and could not produce themselves.

Very soon, however, they turned their attention to agriculture, which sprang up at first in the most fertile territories, where quick results could be obtained with little labour, and gradually this pursuit assumed a greater importance in the occupation of the country.

The chief characteristic of Serbian history from the beginning of Serbian life in the Balkans up to the Middle Ages (fourteenth century) is the tendency towards the formation of independent States, with a distinctive character, all possessing one and the same national feeling. So far, therefore, national distinction is achieved in such a manner as to result in national unity, though politically the Serbs did not form one State until the beginning of the fourteenth century, when they realised, more or less, political unity. Unity of the intellectual life of the whole race was achieved to an even greater extent; we find the same language, the same customs and folk songs, and a highly developed Serbian literature.

The growth of these higher faculties necessitated also the development of the material life of the country, and trade developed. At first, this was internal only. The home market was supplied with products of home industry. But soon, in the different small Courts of the Serbian nobility, there arose the desire for foreign goods, which were brought from the East, especially from Byzantium. This is how Serbian trade with the East began. Naturally, for a time this was limited, because it had to supply the needs of a very limited class of society only. But with the development of national life, the real and more general foreign trade began. At the beginning *export* consisted of *cattle and wheat,* and *import* of *salt,* and a few manufactured articles for the Courts. But the need of the country, as a whole, for manufactured goods, grew very rapidly; as a result, export developed in proportion, especially that of *wheat.* A new feature asserted itself too in the development of the mining industry, which was the first Serbian industry to become of importance for foreign trade.

Even this stage, however, of economic development and varied export was surpassed by the Serbian race in the past. In the fourteenth century, the leading town, Dubrovnik, made an attempt to start factories and industries to replace foreign goods, and so successful was this attempt that very soon these products were competing in the Serbian market with those from abroad. Similar attempts were made in other coast towns, and the whole economic trend of the country at this period indicates that its economic life was again undergoing transformation, and that the race had been carried another step forward in the national evolution of its economic organisation.

Therefore, if the Serbian race at this period is compared with any race in the West, we see that she could take her place among the most advanced races of these times. Economically, it is true, she was an agricultural State, but such was the case with every State in the West at this time, and as soon as mining and manufacture became general, they found great development in the Serbian countries also.

If the social economic organisation of the Serbs at that time is considered, we find that this too would bear very favourable comparison with that of the Western nations. The trade regulations of this period prove that every effort was made to protect and to encourage Serbian trade. In the time of the great Serbian ruler, Stephan Dushan, in the fourteenth century, many such regulations were framed. Much false money was then in circulation, and in the contemporary Serbian law we find laid down the manner in which money was to be minted. Trade by road received great attention, caravans were specially guarded, and in case of accident, the guards of the roads were held responsible (Dushan's *Code,* Article 159).

Regulations were also made to protect travellers staying at inns; all their valuables and belongings could be entrusted to the innkeeper, who was personally responsible for their safekeeping. (Dushan's *Code,* Article 149.)

Laws were also made to favour Serbian export, and anyone putting difficulties in the way of a merchant from Ragusa to buy wheat from the Serbian peasant, or preventing a peasant from selling his wheat was liable to a fine of 500 perpers. (*Monumenta Serbica*, p. 119.)

From the foregoing it will be realised that Serbia possessed, in the Middle Ages, a highly developed economic and social organisation.

Unfortunately, it is not possible to quote from any statistical records of that period, but it will be interesting to quote from a description of the country as seen by a contemporary traveller. A French monk, Brochart, writing in 1332, says:—

"This State (Serbia) is rich in wheat, in vines and cattle. The "land is watered by many rivers and wells; there are many forests "and woods, rich plains and valleys, and everything that grows "is of good quality." Describing industrial conditions, he says: "There are five gold and five silver mines, which are worked without "ceasing, and there are other mines in different places."

This satisfactory condition of the Serbian countries in the Middle Ages was a general result of the united social organisation of the Southern Slav race, and the lands which it occupies are economically so constituted as to form a complete entity for national development. We find large plains, like those of Srem, Batchka and Banat, those of Northern Serbia, of the Rivers Sava, Danube and Morava, and the plains of the Vardar, round Skoplje and Bitolj. On the other hand, we find the forests of Croatia, Bosnia and Serbia, and the mines of Macedonia, Serbia and Bosnia. All these productive territories were connected by national roads, *i.e.*, by roads which led through territories occupied by the same race, so that the different Serbian countries were connected for free economic intercourse. Further, these territories could also export their products by these roads, for they led to national ports on the Adriatic coast, also inhabited by that same Southern Slav race. Foreign trade was organised by these towns, of which Dubrovnik (Ragusa) was the chief, and she represented the commerce, banking, maritime and industrial activity of the whole of the Serbian lands. The trade of these Adriatic towns was widespread, stretching as far as trade could, in the Middle Ages. It was, of course, most active in the Mediterranean Sea and was conducted by a national Serbian merchant fleet. Travellers in the Mediterranean, in the Middle Ages, stated that Dubrovnik alone possessed more than 100 large merchant vessels with over 5,000 sailors.

All these conditions of the free economic life of the Serbian race in the past, explain why at that time the race attained such a high standard and why it was ambitious for a still higher economic organisation. If this social and economic state of affairs could have been continued in harmony for all the Serbian race, we should have seen the growth of a prosperous State, based on the *united* development of the whole Southern Slav race.

But, unfortunately, as it is known, this was not to be the destiny of the Serbian race. The growth of the nation was arrested by foreign invasion and domination, and the national economic organisation destroyed by foreign occupation has never been restored since. In the fifteenth century one Serbian State after another disappeared, and in the nineteenth century the economic conditions and organisation of the Southern Slav countries will no longer bear comparison with those of Western Europe.

In modern times, we find the Southern Slavs living under three different régimes, none of which was conducive to a full economic and social development of the Serbian nation, and each presenting some special peculiarity. So that to-day, when the Southern Slavs are united in one national state, we have still, in order to explain their stage of development, to study their economic organisation, divided under these three different régimes.

At the beginning of the nineteenth century the whole of the Southern Slav lands were under the domination of Austria and Turkey. The population under Turkish rule was continually at war against a system of oppression, and this régime created such a condition of insecurity, and the agrarian system was such, that any economic development was impossible.

The Southern Slav race living in Austria-Hungary could, to a certain extent, develop individually as regards its economic organisation, but nationally, such development was impossible. This created a special state of affairs, so that the position of the Southern Slavs under Austria-Hungary has to be considered separately.

One part of the Serbian nation under Turkish domination succeeded, after a fight of life and death, in liberating itself, and formed an independent state in 1830, which is known as Serbia, and which acquired its full independence in 1878.

We shall, therefore, consider the economic development of the Serbs in Serbia first: this will allow of a full study as the statistical documents of Serbia are the most complete of any of the Southern Slav countries.

After that, we shall present the economic conditions in the new provinces liberated from Turkey in 1912, and, lastly, explain the position of the Southern Slavs who had to live under Austro-Hungarian domination.

Economic Conditions of Serbia.

Population.—In 1834, when the first official statistics with regard to the new Serbian territory were compiled, the population amounted to 678,192, inhabiting an area of 37,840·9 sq. kilometres. The density of the population was, therefore, 17·9 per sq. kilometre.

From 1834 to 1874, the growth of the Serbian population was as follows:—

Year.	Total number of population.	Number per square kilometre.	Year.	Total number of population.	Number per square kilometre.
1834	678,192	17·9	1859	1,078,281	28·5
1840	828,895	21·9	1863	1,108,668	29·3
1846	915,080	24·2	1866	1,216,348	32·1
1850	956,893	25·3	1874	1,353,890	35·8
1854	998,919	26·4			

In 1878, Serbia acquired, after the two Turkish wars, together with definite and full independence, frontiers which she kept until 1913, and the growth of the population was as follows:—

Year.	Town population.			Country population.			Town and country.		
	Male.	Female.	Total.	Male.	Female.	Total.	Male.	Female.	Total.
1880	107,094	89,922	197,016	755,134	772,164	1,527,298	862,228	862,086	1,724,314
1885	132,941	111,376	244,317	865,705	836,332	1,702,037	998,646	947,708	1,946,354
1890	161,153	125,313	286,466	948,732	926,763	1,875,495	1,109,885	1,052,076	2,161,961
1895	178,589	140,786	319,375	1,008,005	985,104	1,993,109	1,186,594	1,125,890	2,312,484
1900	200,285	150,730	351,015	1,080,993	1,060,874	2,141,867	1,281,278	1,211,604	2,492,882
1905	222,870	181,914	404,784	1,159,448	1,123,793	2,283,241	1,382,318	1,305,707	2,688,025
1908	194,379	156,303	350,682	1,258,737	1,211,596	2,470,333	1,453,116	1,367,899	2,821,015

As Serbia has embraced within her frontiers since 1878, 48,302 sq. kilometres, the density of her population was :—

Year.	Number of Inhabitants per square kilometre.	Year.	Number of Inhabitants per square kilometre.
1884	39·4	1895	47·9
1890	44·7	1900	51·6

From these figures we realise that the Serbian population has shown a steady increase, notwithstanding the fact that this population had to live under very hard conditions and with very primitive sanitary arrangements, which have had to be improvised entirely since the liberation of Serbia, as, under Turkey, they were non-existent.

The rate of *mortality* among the Serbian population was, and is, still very high.

The following table shows the percentage of mortality :—

Between the ages of	1895.	1900.	1908.
0—1 year	14·54	13·56	14·23
2—19 years	2·28	1·59	1·71
20—39 ,, ...	1·24	1·16	1·34
40—59 ,, ...	1·85	2·13	2·28
60 and over	4·76	6·69	10·98

The high death rate among infants is specially noticeable, and this does not show any tendency to decrease.

The following statistics show the occupation of the population. Of 100 families, the following were the numbers engaged in various occupations, trades and professions :—

	1900.	1905.		1900.	1905.
Government officials....	2·33	2·8	Labourers	1·82	1·84
Merchants	2·07	2·22	Different professions....	2·05	1·85
Artisans	4·40	4·64	Agriculturalists	87·33	87·37

From this it will be seen that the bulk of the Serbian population is agricultural, and this occupation even shows a slight tendency to increase. It will be necessary, therefore, to devote the chief part of our study on the Economic Life of Serbia to the agricultural activity of her population.

Agriculture.—At the moment of the Serbian liberation from Turkey, Serbian agriculture was in a most primitive condition and the position of the peasant towards the Turkish owner of the land was most hard and unjust. In fact, after the disappearance of Serbian independent States and the Turkish occupation of the Serbian lands, the peasants became the slaves of the Turkish owners. The Serbian nobility disappeared and the land was divided between the Turkish soldiers and officials. The peasant had no interest in the development of agriculture, for such development would not benefit him but the Turkish landlord. This state of affairs was so intolerable that it was certainly one of the chief causes of the Serbian Insurrection of 1804, which led to the liberation of Serbia. After the Constitution of the Serbian State in 1830 one of the first acts of the new Government was to settle the position of the peasants towards the land which they cultivated, and in 1833 all the Serbian peasants established on land belonging to Turkish owners became proprietors of this land. The same idea was adopted after 1878 when Serbia succeeded in obtaining another portion of Serbian territory ruled by Turkey. The Turkish owners were paid by the Serbian Government for their rights over the land and the Serbian peasants became the owners of their holdings. (This was decreed by a law passed in 1880.) This is the chief reason why in Serbia almost everyone is a proprietor, and why Serbia is a country of small holdings. In 1900 there were 401,093 families in Serbia, and 91·59 per cent. of these were proprietors.

The following figures show the division of property:—

	Number of properties.	Percentage of total number of properties.
Under 3 hectares*	98,253	33·490
From 3 to 5 hectares	62,622	21·160
„ 5 to 10 „	80,822	27·55
„ 10 to 20 „	40,782	13·92
„ 20 to 60 „	10,962	3·20
„ 60 to 100 „	397	0·130
„ 100 to 300 „	83	0·014
Over 300 hectares	3	0·001

* 1 hectare = 2·471 acres.

This division of the land in small holdings has its advantages if it is not carried to excess. Agricultural methods in Serbia are still relatively primitive and unintensive and the small holdings very often do not yield an income large enough to maintain a family. Such families with small holdings do not possess enough capital to buy cattle and agricultural implements and a great help in this direction was afforded by the organisation of Agricultural Co-operative Societies. These were started in 1895 and proved a great success.

In 1909 there were 900, with 35,000 members.

In 1913, 1,200 with 40,000 members; 615 of these societies are for credit and 205 for the purchase of cattle and agricultural implements.

Although Serbian agricultural methods are still primitive and unintensive, the progress shown since the independence of Serbia is very great. This is proved by the steady increase in the area of the cultivated land and also in the growing agricultural output of the country. The first official statistics dealing with the cultivation of the soil and agricultural output were collected in 1847 and again in 1867. A comparison shows a distinct increase in the area cultivated and in the agricultural output during this period :—

Land Under Cultivation.

	Year 1847.		Year 1867.	
	In arpents.*	In acres.	In arpents.	In acres.
Maize	421,543	384,657·99	445,820	406,810·75
Wheat	183,632	167,564·20	248,936	227,154·10
Barley	54,562	49,787·82	58,715	53,577·44
Oats	42,901	39,147·16	50,617	46,188·01
Rye	22,638	20,657·17	30,470	27,803·87
Total area of land under cereal culture	761,734	695,082·28	861,070	785,726·38

* One arpent of arable land = 0·365 hectares.
,, ,, vineyard = 0·058 ,,
,, ,, grass land = 0·218 ,,

The *harvest* during these years amounted to :—

	1847.	1867.		1847.	1867.
	Tons.	Tons.		Tons.	Tons.
Maize	159,988	169,413	Oats	10,327	12,309
Wheat	70,272	95,548	Rye	6,349	8,661
Barley .. .	11,254	16,981			

The progress in cultivation is even more noticeable if a comparison is made with the latest statistics :—

Land Under Cultivation.

	1897. In hectares.	Percentage of total area.	1905. In hectares.	Percentage of total area.
Gardens	14,922·17	0·59	25,815·25	1·29
Ploughed land	972,450·31	38·47	1,027,815·71	50·00
Vineyards	68,330·28	2·70	33,101·48	1·60
Orchards	97,971·14	3·88	136,939·51	6·66
Grazing land	652,269·96	25·80	418,391·87	20·35
Forests	481,213·95	19·04	293,011·75	14·80
Commons and uncultivated land.	240,730·17	9·52	110,101·26	5·33

The conclusion to be drawn from these figures is, that the area of cultivated—especially ploughed—land has much increased and this to the detriment of the commons, grass land and forests.

Agriculture, therefore, has made noticeable progress. The only set-back has been the reduction in the number of vineyards. The country was formerly famous for its vines, but the phylloxera has not yet been overcome and the new plants, though important, have not succeeded in making up for the destruction of the old.

If arable land is considered we find the following figures :—

	1906.	1908.
	In hectares.	In hectares.
Cereals	645,898·71	640,202·02
Maize	548,155·86	566,407·20
Meadows	325,644·16	324,143·78
Orchards	132,085·14	143,474·36
Vines	34,803·87	40,474·23
Potatoes	29,053·58	26,805·27
Industrial plants (tobacco, poppies, etc.).	15,973·91	17,920·40
Vegetables	9,121·06	10,116·21

The *harvest* during these two years and that between was :—

	1906.	1907.	1908.
	Tons.	Tons.	Tons.
Maize....	705,790·9	449,374·7	533,691·5
Cereals	576,083·9	366,457·5	457,734·8
Hay and clover	556,545·3	307,027·1	226,858·5
Straw	543,857·2	338,560·2	777,728·9
Plums	344,380·2	288,275·0	530,061·8
Potatoes	113,954·7	58,990·5	54,946·4
Various fruits	104,152·3	107,666·8	97,057·0
Vegetables	67,317·8	29,185·7	30,229·7
Grapes	57,440·7	53,609·3	85,570·0
Industrial plants	22,424·3	43,606·2	42,132·0

Cattle Raising.—In addition to agriculture, Serbia has always been a cattle-raising country. We know that in the Middle Ages the cattle of Serbia were considered to be the best of all the Balkan States. During the Turkish occupation this industry, with all others, was ruined, but with the liberation of Serbia it was re-started and the progress, on the whole, has been very great, although at one period the number of cattle shows a slight decrease.

The first statistics dealing with cattle are those of 1846 and are as follows :—

	1846.	1859.	1866.
Horned cattle	672,738	802,692	741,425
Bulls and bullocks	280,334	334,349	307,516
Horses	—	—	18,680

The latest statistics dealing with live stock in Serbia are as follows :—

	1890.	1895.	1900.	1905.
Sheep	2,963,904	3,094,206	3,061,759	3,160,166
Pigs	908,603	904,446	959,580	908,580
Cattle	819,251	915,428	956,661	962,503
Goats....	509,738	525,991	432,067	510,063
Horses	163,391	169,928	184,849	174,363
Oxen	8,494	7,471	6,929	7,450
Donkeys	1,463	1,645	1,762	1,247
Mules....	125	133	178	737
Total	5,374,969	5,619,248	5,603,785	5,724,639

A comparison of the above totals shows an increase and they are more suggestive if compared with the first available statistics. Then the development appears really important. It is also noteworthy that sheep, pigs and cattle are the prevailing live-stock found in Serbia.

Industries.—From our examination of the occupations of the Serbian population we know that almost all are occupied in agriculture. Serbian industries have lately developed to some extent, but we shall see that a full development of the economic life in Serbia was impossible.

At present the most important industries are of a domestic character, first started to utilise the abundant natural products of the country and to supply the needs of the peasant family. Some, however, have developed to such an extent that they now supply the rest of the community and deserve mention as industries proper. The most important are : making of brandy, cheese, carpets, earthenware and woodwork ; drying of plums for prunes and flax spinning.

Modern Serbian industries in the same way utilise the raw products of the country and largely supply the home market. The chief are: flour milling, beer and jam making, and the making of pottery.

At first most of the *flour mills* were driven by water, but since 1880 steam has been used and in 1890 Serbia possessed 102 steam mills with a capital of 3 million francs. In 1905 this number had increased to 244 with a capital of 10 million francs. In 1890 there were 11 *breweries*, with an invested capital of over 2·3 million francs, increased in 1909 to 4·5 million. Up to the present *jam making* has not been conducted through large factories; only one such existed and jam was made in a primitive manner and in small proportions by local merchants. The *textile industry* has a great future and before the war there were three establishments of modern importance. There are many *saw mills* in Serbia, 14 being established on a large scale.

The chief development, in the future, of Serbian industry lies undoubtedly in the utilisation of the raw material which is available in Serbia, not only in the agricultural products and fruit, but in the forests and mines.

Forests.—To-day, Serbia possesses over 1½ million hectares (3,750,000 acres) of forest, one-third of her total area. Of this, over two-thirds is State and communal property, only 300,000 hectares (750,000 acres) being private property.

The chief varieties of trees are: *Beech* (300,000 hectares); *Oak* (137,000 hectares); and *Pine*, with other coniferous varieties (82,000 hectares).

The most important forests belonging to the State are:—

	Hectares.	Acres.
Homolye	120,000	300,000
Miroch and Deli-Jovan	27,000	67,500
Rudnik	17,000	42,500
Malyen	20,000	50,000
Baranya	15,000	37,500
Tara	25,000	62,500
Gotch	20,000	50,000
Yastrebatz	30,000	75,000
Toplitza	30,000	75,000
Kukavitza	25,000	62,500

Mines.—Serbia has large mining resources. Traces of *débris*, shafts, coins and tools show that the mines were worked in Roman times. We have explained how this mining industry developed when Serbia had a national economic organisation in the Middle Ages. With the Turkish domination the mining industry disappeared. But as soon as Serbia was liberated she began to take a renewed interest in mining, and the Serbian Government, when the Serbian State was in process of organisation, took a prominent interest in the mines and their exploitation. But the lack of capital and means of transport handicapped the development of mining. Consequently this industry is now in its first stages in Serbia and the most important work still remains to be done. Up to the present the most satisfactory results have been achieved in the mining of *copper, gold* and *coal.*

We give in the table on the next page the statistics showing the amount of ores exported between 1904 and 1908, but these figures ought not to lead to any wrong opinion as to the possibilities of the still unworked mining resources of Serbia. Since these statistics were compiled, one copper mine alone has exceeded the results of the copper mines here shown, and in 1910 the export of ore from this mine amounted to over 8 million francs worth.

Foreign Trade.—All we have stated up to now about the development of the economic conditions and organisation of Serbia, and the chief occupations of the Serbian population will be proved by a study of Serbia's foreign trade. Of course, when Serbia first obtained an independent existence, this trade was extremely limited. It was merely a kind of local trade within the frontier, and consisted chiefly of the export of pigs. Food, especially wheat, was imported. This was quite natural at a time when agriculture was still little developed. But things changed quickly and Serbia has exported in increasing quantities, agricultural raw products, cereals, live stock, pigs, cattle and fruit, and has, at the same time, imported increasing quantities of manufactured articles.

From the following figures we shall see, (1) the gradual development of Serbian trade, (2) the goods imported and exported, (3) the increase in the import and export trade, and finally the different countries with which Serbia dealt.

(1) Figures showing amount of Serbia's foreign trade (in francs) :—

Year.	Import.	Export.	Percentage of total foreign trade.	
			Import.	Export.
	Francs.	Francs.	Per cent.	Per cent.
1869	26,659,546	33,863,709	44·05	55·95
1870	27,937,238	30,595,420	47·73	52·27
1875	31,219,243	35,014,874	47·13	52·87
1880	46,095,614	35,212,269	56·69	43·31
1911	115,425,600	116,916,000	47·62	52·38

Export of Ores, in metric tons.

	1904.	1905.	1906.	1907.	1908.
Coal and lignite	2,631,810·00	184,401·00	2,375,067·00	268,315·00	296,125·00
Gold (in kilogrammes)	89·450	87·043	139·747	149·00	191·00
Silver (in kilogrammes)	48·487	9·579	3·295	35·00	823·00
Black copper	1,641·30	35,088·00	7,613·00	1,764·00	2,198·00
Copper ore	500·00	—	—	—	—
Lead	245·40	42,153·00	213·00	52·00	1,552·00
Ores of lead and zinc	—	—	102·00	40·00	274·00
Antimony	4,725·00	83,709·00	3,200·00	179·00	261·00
Pyrites	—	—	—	—	32,726·00
Cement	52,500·00	6,000·00	92,357·00	7,044·00	11,074·00

(2) Figures showing value of goods imported into and exported from Serbia (in francs) in 1911 :—

	Imports.	Exports.
	Francs.	Francs.
Textile goods	31,326,000	2,143,000
Agricultural products (raw and preserved)	20,062,000	64,788,000
Metals and hardware	19,461,000	9,657,000
Machinery and electrical apparatus	11,861,000	28,000
Live stock and animal products	10,445,000	38,130,000
Drugs and dyes	7,573,000	288,000
Ore, coal and mineral products....	6,936,000	718,000
Hides, leather, pelts	4,140,000	37,000
Timber	2,262,000	858,000
Paper and papier-mâché goods	2,210,000	9,000
Furniture	1,671,000	66,000
Glassware	1,520,000	—
Pottery	1,303,000	109,000
Watches, small-arms and toys	1,138,000	—
Fatty products	879,000	18,000
Jewellery and precious stones	843,000	—
Scientific apparatus and art goods	489,000	—
Rubber, gutta-percha	435,000	1,000
Stone, asphalt, plaster, cement....	315,000	43,000
Books and pictures	302,000	19,000
Brushes, brooms, &c.	84,000	4,000
Wicker-work goods	79,000	1,000

(3) Different countries from which Serbia imported goods and into which she exported from 1900 to 1911 ; figures showing value in francs. (See next page.)

If the productive economic capacity of Serbia is considered from these statistics, we see that the bulk of the Serbian exports consists of agricultural products and cattle, and the capacity of the production of these articles has constantly risen, notwithstanding the fact that foreign trade in these goods was always hampered, and sometimes completely prevented, as we shall see.

As regards agricultural production, the first place is certainly taken by the cultivation of *maize*, which is the staple food of the population and of the large quantities of pigs and cattle. Maize is grown to such an extent that not only is this great home consumption satisfied, but, in 1910, maize was exported to the value of over 21·4 million francs.

The cultivation of *wheat* takes second place, but is also very important. The consumption of wheat is less than that of maize, and in 1909 the export valued over 29 million francs.

In our general statistics we have included *fruit export* in the agricultural products. It would be interesting perhaps to note that

	1900.		1904.		1908.		1911.	
	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.	Imports.	Exports.
	In francs.	In francs.	In francs.	In francs.	In francs.	In francs.	In francs.	In francs.
Austria-Hungary	25,528,875	56,584,701	36,583,709	55,351,227	32,151,945	21,501,402	47,448,000	48,433,000
Germany	15,015,743	3,912,958	8,054,981	2,606,517	21,361,347	14,018,977	31,347,000	28,933,000
England	3,773,603	—	5,002,120	2,500	8,803,350	498,717	9,524,000	87,000
France	3,522,808	369,160	974,586	22,020	1,563,053	3,042,724	5,746,000	3,814,000
Turkey	1,239,281	1,456,493	1,965,236	1,707,200	3,146,543	10,968,164	3,884,000	11,984,000
America	1,119,002	—	745,274	1,000	473,970	1,985,600	2,136,000	3,609,000
Roumania	944,227	3,063,592	1,254,540	843,165	734,435	3,004,100	1,539.000	6.141,000
Italy	766,452	—	877,042	137,976	2.271,714	3,490,054	4,861,000	4,394,000
Greece	430,647	—	386,740	5,500	314,642	224,161	325,000	110,000
Holland	404,189	18,662	221,226	—	349,515	—	509,000	7,000
Belgium	356,572	68,735	560,893	230.107	1,601,576	16,133,792	2,081.000	6,142,000
Switzerland	351,303	114,608	907,666	—	1,336,701	90,709	1,553.000	258,000
Bulgaria	278,808	629,049	2,103,361	1,012,639	294,096	1,860,028	697,000	2,802.000
Russia	197,342	80,502	1,072,473	45,412	1,010,995	23,540	3,392.000	53,000
Bosnia and Herzegovina	40,888	223,499	56,281	190,803	119,786	65,232	220,000	112.000
Montenegro	27,488	—	60,278	—	46,399	9,406	69,000	3,000
Other countries	—	—	—	—	55,350	832,472	152,000	2,000

fruit growing is extremely important and that great results could be achieved in this direction. At present the most extensively cultivated fruit is the plum, which has achieved quite a famous reputation, but which is often known abroad as the German plum, because its export is effected through German intermediaries. The export of prunes was as follows :—

	Tons.	Value in francs.
1906	48,270	12,067,520
1907	42,648	15,743,616
1908	49,042	10,350,721
1910	23,901	10,488,043

and the export of plum jam :—

	Tons.	Value in francs.
1906	12,439	3,175,087
1907	13,306	4,257,932
1908	14,898	3,251,093

In addition to these figures a certain quantity of plums were also exported in 1910, valuing about one million francs.

The export of other fruit besides plums, was :—

	Tons.	Value in francs.
1905	44,440	2,169,000
1906	15,500	1,095,100
1907	30,450	2,492,900
1908	17,310	1,480,400
1909	—	2,288,300
1910	—	2,740,000

The second item of importance in Serbian export after food stuffs is that of *live-stock* and *meat.* The growth in the quantity exported shows the progress made in cattle raising ; but to be able to judge this from the official statistics, it should be known that among the many difficulties which Serbian trade had to overcome, special difficulties lay in the way of the export of cattle and meat which was many times completely prohibited.

The export of cattle and pigs was the first item in the foreign trade when Serbia gained her independence. And until 1905, this export was almost completely directed into Austria. Since that date the tariff war between Austria-Hungary and Serbia began, and the export was directed to Turkey, Egypt and Italy.

Export of cattle estimated in heads :—

To	1905.	1907.	1909.	1910.
Austria-Hungary	71,937	—	—	—
Bulgaria	89	853	665	185
Turkey	89	4,031	22,154	36,161
Egypt	—	3,344	5,809	—
Italy	—	2,842	6,396	—
France	—	2,100	—	—
Greece	—	—	665	—

The export of pigs estimated in heads, was :—

To	1905.	1907.	1909.	1910.
Austria-Hungary	121,930	—	—	—
Bulgaria	132	—	9,929	3,352
Egypt	—	—	4,799	—
Turkey	140	1,987	8,718	4,720
Italy	—	7,227	1,415	275
Greece	—	—	154	—
Rumania	—	635	—	5,285

As the export of live-stock was greatly handicapped by the Austro-Hungarian policy of handicapping Serbia's trade, slaughter-houses have been established in Serbia, and their activity has been chiefly devoted to prepare meat for export. Serbia had five establishments of this kind where about 50 to 60 thousand head of cattle and about 150 to 180 thousand pigs were slaughtered every year. The chief establishment, which is in Belgrade, exported :—

Killed meat :—	Head.		Tons.
1911	22,018	=	9,082·111
1912	23,170	=	9,556·294
1913	10,849	=	5,325·690
Pork :—			
1911	68,047	=	9,751·277
1912	89,044	=	11,426·760
1913	100,776	=	12,913·465

The rest of the Serbian export consists chiefly of raw products, of which hides, timber and ore should be mentioned, but which cannot be studied in such a short survey.

This economic progress was achieved in such a short time in spite of the fact that Serbia had to create the whole of her economic existence. In fact, when she was liberated in 1830 she had no economic organisation or production.

Means of communication.—The first attention of the Serbian State was given early in its existence to the construction of some dams on the river Save and the construction of roads. For a long time the only communications were by road. And these consisted chiefly of surface tracks, and were rarely paved with stone, except in the case of one or two of the chief thoroughfares. Until 1884, Serbia had no railways.

The situation to-day, as regards means of communication, is this:—

Serbia has succeeded in building in macadam her most important roads and establishing the necessary bridges and viaducts. It is estimated that Serbia has spent about 100 million francs in constructing these chief roads of communication, and she had about 15 thousand kilometres of roads, including those of local interest.

Railways.—The first Serbian railway was constructed between Belgrade and Nish in 1884. According to the statistics of 1908, Serbia had 625·3 kilometres of State railways.

(In New Serbia there are about 400 kilometres, and if all the additional constructions since 1908 and local and private lines are taken into consideration, the full length of the Serbian railways would be about 1,700 kilometres.)

The rolling-stock at the same date consisted of 78 engines and 2,558 railway wagons.

River communication.—Transport by rivers (on the Save and Danube) is performed by a Serbian Navigation Company. In 1908, the figures relating to this were as follows:—

The Company disposed of—

8 ships.
46 barges.
2 boats for transporting wood.
15 rafts.

By these means—

306,580 persons;
159,775·8 tons of goods; and
66,870 logs were transported.

The figures showing the development of the postal service are as follows:—

In	1898	Serbia had	119	post offices.
,,	1901	,,	120	,,
,,	1904	,,	1,241	,,
,,	1907	,,	1,450	,,
,,	1908	,,	1,493	,,

As regards telegraphic service, the following figures show (in kilometres) the length of the telephonic and telegraphic distances:—

	1905.	1908.
Telegraph ...	3,281·6	3,439·3
Telephone	1,446·2	2,126·0

Currency and Banking.—At the moment of Serbia's liberation her monetary condition was the same as that of Turkey, which was extremely unsatisfactory. Over forty different varieties of coin were in circulation in Serbia, chief of which were Austrian and Turkish. One of the first duties of the Serbian authorities was to adopt the Turkish piastre as the legal standard of coinage, and to fix the rate of exchange of all money circulating in the country to the piastre. This rate of exchange, however, could not remain stable owing to the diminishing value of the Turkish piastre, and as soon as 1833 the Serbian Authorities were obliged to lower the exchange rate of the piastre to half its nominal value, so that a new idealistic unit was created, the Government tax grosche, the value of which corresponded to the 10 kreutzer piece, or, 200 tax grosches were equivalent to 421 ordinary Turkish grosches. To overcome this unsatisfactory state of affairs, the Government began to coin national money, according to laws passed in 1868 and 1869. In 1878 the monetary question was definitely solved by the adoption of a national currency, and by the adoption also of the system of the Latin monetary union, with one difference only: the Serbian unit was a *gold dinar*. In practice, however, the dinar was of silver, which was always liable to a gold premium in the exchange for gold.

For instance, the exchange of the French sovereign for Serbian dinars in 1908 was as follows:—

January.	March.	May.	July.	September.	November.
20·22	20·31	20·22	20·06	20·04	20·46

This indicates clearly the instability of the Serbian currency, which was of great disadvantage to trade.

Nevertheless, during the last ten years before the war, a growing stability was noticeable, and the gold premium constantly decreased.

(In 1903 it amounted to 4·6 per cent.; in 1904, 3·5 per cent.; in 1905, 2 per cent.; in 1906, 1·3 per cent.; in 1907, 1 per cent.)

Just before the war of 1912, the Serbian Government had contemplated transforming the unit from silver to gold. This was quite possible then, because the gold reserve of the National Bank, the note-issuing Bank of Serbia, was quite adequate for such a change. (After the Balkan wars, the paper circulation in Serbia amounted to about 100,000,000 dinars, and the gold reserve to about 60,000,000 francs).

In 1912 there was in circulation in Serbia

15·6 millions of silver money.
3·6 ,, nickel ,,

which was increased during the Balkan war by

10 millions of silver money, and
2·4 ,, nickel ,,

The notes issued by the Serbian National Bank before the recent war amounted in value to 100,000,000 dinars.

The first Serbian bank was created in 1869, after which progress was for a time slow, owing to the inexperience and the misfortune of the first banking institution. But during the last few years especially great development has taken place. Before the war of 1912, Serbia possessed 177 banking and credit organisations. Some of these were very limited in importance, and strictly speaking did not deserve the name of banks, but nevertheless they helped the banks proper to organise credit and to direct the available capital in the country into productive channels. The discount of bills forms the chief active business of the Serbian banks, and deposit the chief passive business. Of these 177 banks only 5 are created with foreign capital, in which French, Austrian and German capital finds a place. Up to the present, English capital has not been represented in Serbian banks.

In 1908, the position of the chief Belgrade banks was as follows :—

Figures given in dinars.

Name of bank.	Paid in capital.	Deposits.	Total value of bills discounted.	Total turnover.	Net profit.
Serbian National Bank	7,500,000	—	54,275,480	214,996,056	643,098
Banque d'Exportation	2,500,000	296,744	1,572,682	26,534,153	125,856
Banque de Crédit Serbe	1,200,000	434,779	1,918,893	125,371,675	150,784
Association de Belgrade	1,000,000	1,688,461	29,111,495	38,161,277	259,664
Banque Commerciale de Belgrade	1,000,000	1,043,942	14,625,401	117,396,111	191,515
Etablissement de Crédit de Belgrade	906,000	678,756	16,412,740	22,403,588	91,224
Banque de Crédit des Artisans	941,557	140,658	3,633,454	10,190.408	38,489
Banque d'Echange	800,000	1,544,168	22,033,579	48,456,118	143,507
Association des Employés	700,000	121,706	598,348	729,169	54,628
Banque Central Serbe	500,000	40,391	4,617,855	9,228,532	36,860
Association de Vračar	500,000	1,965,982	8,140,924	24,898,881	65,000

Public expenditure and revenue.—This rapid economic development and organisation of Serbia is also visible from the statistics showing the increase in the Serbian public expenditure and public revenue. At the time of the formation of the Serbian State, the Budget was very small, public revenue was limited and was not even distinct from the private income of the Serbian Prince. But as the State organisation developed, expenses increased and the public revenue had to be increased too. The whole of the economic organisation which we have reviewed had to be created in less than 80 years, and it is rather remarkable that a primitive and poor peasant country, such as Serbia was in 1830, could achieve this. There was no capital to draw upon, and the whole public expenditure could be covered only by the annual surplus created by the productive capacity of the people. If the growth of public revenue and expenditure is considered, we find the following figures (in francs) :—

Years.	Public revenue.	Public expenditure.	Years.	Public revenue.	Public expenditure.
1882–83....	34,480,000	34,369,919	1900	77,789,648	76,269,245
1885–86....	46,000,000	45,968,639	1905	88,046,000	87,632,278
1890	47,296,864	46,196,864	1908	95,239,037	95,091,251
1895	63,755,600	63,623,868			

Although the public revenue increased with the economic capacity of the country, it was nevertheless impossible to meet all the expenses incidental to State organisation thereby. That is why, early in her independent life, Serbia had to have recourse to public loans which were all contracted abroad. The first of these loans were contracted in 1876 and 1881. The Serbian national debt in 1915 amounted to 897·5 million francs. The Serbian loans were placed abroad as follows :—

France	To amount of	762·2	million	francs.
Germany	,,	,,	148	,,	,,
Austria-Hungary	,,	,,	43	,,	,,

The amortisation of the Serbian public debt was assured by setting aside various public taxes specially for that purpose. In 1913 the annual amortisation was 32·8 million francs and the amount of taxes collected for the purpose exceeded this sum by over 21 million francs.

The result of this examination of the economic development of Serbia convinces us that though the achievement in this direction was relatively very great, it is not what it should be if the economic possibilities of the Serbian race are taken into consideration.

There was also another part of the Serbian nation which lived in an independent State, viz., in Montenegro. The economic conditions of Montenegro are practically the same as those of the southern and mountainous parts of Serbia, and what has been said as to the impossibility of full national economic development in Serbia, applies even more to Montenegro. In fact, this State does not possess enough natural resources to start an independent economic existence. This is best proved by the fact that in 1910, Montenegro's foreign trade deficit amounted to 5·8 million francs. Export amounted to 2·4 million francs and import to 8·2 million, of which 4·5 million (56 per cent. of the total) came from Austria-Hungary.

In 1912, Montenegro had an area of 9,080 square miles with a population of 285,000, which was increased in 1913 to 15,087, with a total population of 435,000. The population is occupied in *cattle raising* and *agriculture* and the total land under cultivation, in the old provinces, was 78,000 hectares. The same products are grown as in Serbia.

Economic conditions in the Serbian territories liberated in 1912.

The best method of showing how important was the economic development of the population living in independent Serbia is by comparing it with the economic conditions of the Serbian population under Turkey.

Population.—The area of the newly-liberated territories is estimated at 43,000 to 44 000 sq. kilometres, and the population of these territories was estimated at 1,500,000. It is, unfortunately, impossible to give particulars showing the development of this population, as the statistics for this territory, as long as it was under Turkish denomination, are not available. The same reserve must be observed with the figures given below. They will be found to be incomplete, and most of them are estimates made by the Serbian authorities since the liberation of these territories.

The chief characteristic of the population is its scantiness, compared to the extent of territory, as many of the people emigrated to escape from the Turkish rule, first to Serbia, and then to America. The occupation of the population is almost exclusively agricultural, even much more so than in Serbia, because here commerce and trade are very often in the hands of people who are not Serbian. The economic conditions of this population are very primitive, as their chief occupation, agriculture, is carried out in a very primitive manner.

Agriculture.—The principal reason for these primitive agricultural methods is the condition under which the land is cultivated by the peasants. The very small holdings belong generally to the Serbian population, but they do not yield enough profit inasmuch as in these territories agricultural products are cheap and difficult to export.

Often this class of people, possessing small holdings, would remain at home long enough to cultivate them, and the rest of the year migrate and carry on a certain amount of trade. Large properties were, as a rule, owned by Turkish landlords who were called "begs." These properties were generally cultivated by Serbian peasants, who were their tenants. The relations between the Turkish owners of the land and the Serbian tenants changed, in time, so that different conditions exist to-day. The most usual terms of tenancy are that the peasant receives lodging, one team of cattle, and seed. His duty is to cultivate the ground, and from the harvest the owner takes one-tenth for taxes, the amount of the seed advanced, and the remainder is divided between the owner and the peasant tenant. This system resulted in the fact that agricultural methods in the newly-liberated territory are very primitive. The land is ploughed by a wooden plough, and on this account and the miserable condition of the poor cattle, the ploughing is but superficial.

As a result of the scarcity of the population, and the conditions above mentioned, the land in this new territory is very little cultivated. It has been estimated that before 1912, about 8 per cent. of the soil of Turkey in Europe was under cultivation, and that not more than 5 per cent. of the soil now belonging to Serbia was cultivated. But the land is rich and fertile, and 50 per cent. of it is certainly suitable for agriculture, which shows the future possibilities. It ought to be mentioned that it is from these provinces that the wheat came which had a great reputation in mediæval Serbia as an article of export. The figures dealing with agriculture in these territories, at present available, are as follows :—

Land under cultivation (in hectares).

	Department of Kossovo.	Department of Monastir.
	hectares.	hectares.
Cereals	319,481	185,484
Vines	11,299	11,947
Vegetables	10,034	8,279
Industrial plants	8,252	20,727

The fertility of the soil is shown by the harvest from one hectare (in hectolitres) :—

	Department of Kossovo.	Department of Monastir.
	hectolitres.	hectolitres.
Barley	20·88	23·22
Rye	19·03	20·92
Oats	18·82	17·20
Wheat	17·88	18·99
Maize	17·60	21·47

Cattle.—In the old Serbian State, the territories which we are now describing were famous for cattle raising, but that industry lost much of its importance during the Turkish occupation, so that the quality of the live-stock found in the newly-liberated territories is much below that of Serbia.

It has been pointed out that the area of cultivated land in these territories is very small in proportion to the total acreage. As the forests are also in bad condition, many of them having been devastated, the soil cannot obtain sufficient moisture to produce good pasture ; it is dry and the vegetation poor. In addition to the poor pasturage, there is no selection in breeding ; the cattle are used for labour while very young, which retards their growth. For these reasons the cattle are much smaller in size and poorer in quality than those of Serbia. In the new territories the same varieties of live-stock are found, but while there are so many pigs in Serbia, they are rare in the new territories, and sheep and goats are more abundant.

Before the liberation of these territories, the estimate of the live-stock was as follows :—

	Department of Kossovo.	Department of Monastir.
	Heads.	Heads.
Sheep and goats	1,662,797	1,748,607
Cattle	405,338	302,259
Horses, donkeys, mules ..	116,869	108,451

Forests and mines.—We know that the forests and mines in Old Serbia were famous in the Middle Ages, especially those in the territories under Turkey until 1912. Timber was also imported for shipbuilding and construction from these regions; the exportation of ore was one of the most important items of the old foreign trade of Serbia. To-day there is not much to say about these industries; they were ruined by Turkish rule. A distinction, however, is to be drawn. The forests are devastated, and they need nursing for years. The mineral riches are still in the soil, but unexploited, they require investigation and working. There are no statistics available about the forests and mines. It is estimated that 60 per cent. of the total territory of new Serbia is ground which was once forest-land, and is about 2,280,000 hectares in extent. But to-day, 75 per cent. is bare, 570,000 hectares are under forest, but not more than 114,000 hectares are under full-grown forest.

The mines in new Serbia are all abandoned, and, therefore, it is not possible to give any statistics. Only one or two were worked in modern times. Antimony and arsenic were exploited in *Alschar*. The mine was worked from 1891 to 1895, and produced 4,000 tons of antimony ore with about 53 to 62 per cent. of pure antimony, and 2,000 tons of arsenic ore, with 40 to 55 per cent. of pure arsenic. In *Rabrovo*, as much as 3,000 tons of chromide was exploited, with as much as 50 per cent. of chromeoxide.

But, although there is not a single mine working, the soil is full of mineral riches. Galleries of old mines show this, and traces are found of ore with gold, silver, copper, iron, lead, sulphur and coal. In the place where the Serbian mediæval town of *Novo Brdo*, famous for its mines, used to be, traces are found of galleries, 6 kilometres in length, and the ore contains: siderite (lodestone), pyrolusite (native manganese dioxide); hæmatite (valuable ore of iron); limonite (iron ore); and galenite (sulphide of lead).

Foreign trade.—With such a primitive economic organisation, scanty population, and no capital in the country, trade, too, was very limited. This can be judged by the foreign trade. Here is a Serbian estimate of how much that trade amounted to yearly, approximately, and of what kind of goods it consisted:—

Export from the new territories.—According to an official statement of the Serbian Ministry of Agriculture in 1914, the export trade of the new territories was estimated as follows :—

	In thousands of francs.	
		£
Opium and poppy heads	7,179	299,125
Tobacco	5,756	239,833
Fruit, chiefly grapes	3,556	148,166
Silk cocoons	3,000	125,000
Hides	2,466	102,750
Cattle, chiefly sheep	1,793	74,708
Cereals, wheats	1,356	56,500
Rice	616	25,666
Flour	378	15,750
Wool	348	14,500
Foodstuffs	286	11,916
Woollen goods	176	7,333
Gutskins	70	2,916
Ropes	54	2,250
Wine	36	1,500
Metals	17	708
Sundries	500	20,833
Total	27,587	1,149,454

Import into the new territories.—An examination of the imports into the new territories reveals the following figures :—

	In thousands of francs.	
		£
Woollen and cotton goods	12,733	530,541
Metals and hardware	5,609	233,708
Flour	4,603	191,791
Sugar	4,027	167,833
Leather and leather goods	2,633	109,708
Chemicals and soaps	2,118	88,250
Cereals (wheat)	1,696	70,666
Rice	1,380	57,500
Petrol	1,246	51,916
Salt	1,148	47,833
Coffee	1,142	47,583
Foodstuffs	1,191	49,625
Glass and china	850	35,416
Jute goods	847	35,291
Paper	815	33,958
Spirits	805	33,541
Building material	640	26,666
Fruit and vegetables	635	26,458
Machinery	512	21,333
Oil	306	12,750
Drugs	254	10,583
Beer	205	8,541
Wine	87	3,625
Sundries	3,698	154,083
Total	49,180	2,049,199

The comparison between economic conditions in Serbia and those in the newly-liberated territories shows that the development in Serbia was enormous. But if the density of the Serbian population, their occupation, and the production of the country is compared with those of the Western countries of Europe, then Serbia's conditions are still only primitive. This is because but one small part of the Serbian population succeeded in forming an independent State, and that population was only just strong enough to form the most necessary economic organisation. Even that was hampered by the special frontiers which Serbia was given in 1878, which enabled Austria-Hungary practically to control her, economically. It was indeed essential for Austria-Hungary, in order to continue her very existence as a State which was based on the domination of foreign races, and of a goodly part of the Serbian race, to separate the Serbs in Serbia from the Serbs in Austria-Hungary. This was effected by her policy with regard to economic communications, which was to give the economic development in Serbia a local character and limit it as much as possible.

One typical example of this policy—it is impossible here to explain the scheme in detail—was the attitude of Austria-Hungary on the occasion of the conclusion of commercial treaties by the new Serbian State in 1878.

Before this date, Austria-Hungary had a privileged economic position in Serbia, which she imposed on that vassal state of Turkey. After 1878, having acquired full independence, Serbia wished to shake off that economic domination and to trade freely with other countries. It is interesting to note that the first Serbian commercial treaty to this effect was concluded with Great Britain in February, 1880. But Austria-Hungary, in order to prevent this, closed her frontiers and prevented all export from or import into Serbia. At that time this was the only way by which Serbia could conduct international trade, and she had to give in, and Austria-Hungary once more resumed her monopoly over Serbia.

Since 1906 this monopoly was becoming weaker. Serbia decided first to resist Austria-Hungary and to divert her export trade towards Salonica. This is visible in our figures relating to the foreign trade of Serbia. This attitude of Serbia became even stronger after 1912 when she secured one main line of her economic communications: the *Vardar Valley.*

Austrian economic control, however, was not removed, because Austria-Hungary still dominated the other Serbian economic outlets, the Sava Valley and the Adriatic Sea.

Southern Slavs under Austria-Hungary.

This domination had to be removed too, and a national development made possible for the Southern Slav race living under Austria-Hungary.

Population.—The Southern Slavs lived in Austria-Hungary in the following provinces, and the numbers of this Southern Slav population, according to Austro-Hungarian statistics, are as follows:

In—

Bosnia-Herzegovina	1,900,000
Croatia-Slavonia	2,300,000
Dalmatia	611,211
Southern Hungarian Provinces (Batchka, Banat, Baranja, Medjumurje)....	720,000
Istria	280,234
Southern Styria	409.835
Southern Carinthia	82,230
Carniola	491,083
Goritza, Gradishka	154,750

The economic organisation of this population was completely incorporated in that of Austria-Hungary, and it was impossible for the Southern Slavs of these provinces to start a national economic life of their own. How far this is so, is easily proved by the fact that it is impossible to study statistically the economic condition of the Southern Slavs in these provinces. Indeed, generally, the administrative division does not correspond to the national division of the land. For instance, the Serbs living in the Southern part of Hungary live in four different provinces, and if agrarian statistics are taken they are given for the whole provinces, and the economic conditions of the Serbs are incorporated in the documents showing the economic conditions of the Hungarians.

On the other hand, in an administrative division, such as Croatia and Slavonia, composed only of a Croat and Serbian population, then even in this case some aspects of the economic life cannot be statistically represented, because the trade figures are incorporated in the general trade of the whole of Hungary, under whose rule these provinces were. With some approximate calculation in proportion to the population, figures could be obtained, but we do not propose to follow such a system. We will give a short survey of the economic conditions in general, although all these Southern Slav lands vary in individual economic organisations, we will use the statistics which are available, and draw our conclusions as to the economic conditions of these countries.

Occupation of the Population.—Although the agricultural conditions between the peasants and the landowners are different from those in the countries liberated in 1912, the chief occupation of the Southern Slavs living in the different provinces of Austria-Hungary mentioned above is agriculture.

In Croatia–Slavonia (which is the chief agricultural country after the Serbian lands in Southern Hungary, but which we do not propose to consider here, because for a statistical study it is not suitable, being administratively incorporated in the Hungarian statistics) 85 per cent. of the population is engaged in agriculture.

The land is very fertile and was divided up as follows :—

	Per cent.
Area of ploughed and garden land	36
,, woods and forests	35
,, grazing ground	13
,, meadow land	10
,, uncultivated land	5
,, vineyards	1

The division of property in Croatia and Slavonia is quite different from that in Serbia, where 54·65 per cent. of the holdings are less than 5 hectares in extent, there being only 63 holdings of over 100 hectares. In Croatia and Slavonia there are 4,408 properties of over 100 hectares, covering an area of 3,223,065 hectares, which is 27·25 per cent. of the total private property.

The average acreage of land devoted to the principal cereals under cultivation for the period 1911–1914 was as follows :—

	Acres.
Maize	738,841
Wheat	582,766
Oats	174,728
Rye	159,384
Barley	110,063

Amount of production of the principal cereals, in tons :—

Maize	326,692
Wheat	187,252
Oats	38,266
Rye	41,723
Barley	27,439

If we consider Bosnia and Herzegovina, where the conditions are totally different, then we see also that almost the whole of the population is occupied in agriculture. Indeed, only 31,606 people are occupied in industry.

The average yearly production during the period 1902–1904 was as follows :—

	Tons.
Wheat	444,790·1
Vegetables	127,695·0
Potatoes	59,553·5
Tobacco	2,805·1
Industrial plants	2,301·6
Hay	612,635·7
Clover	2,623·7
Plums	141,841·8
Grapes	5,779·9
Other fruit	44,296·6

But the agricultural production of Bosnia and Herzegovina is far from what it ought to be. In fact, the agrarian system of the countries is to-day just the same as it was in 1878 at the time of the Austro-Hungarian occupation of these lands, and which was one of the chief Austrian arguments for her occupation.

Under this system a great quantity of the land is cultivated by holders (kmeti), comprising to-day about 112,000 families, who cultivate the land of the agas, acquired during the Turkish domination; the same system in fact explained above, for the Serbian territories liberated in 1912. The "kmeti" have a right to buy themselves free, but that process is very slow and only a few hundreds a year succeed in doing so. The largest number, 1,409, was reached in 1884. Since, it has declined, and was in—

1900	816	1902	603	1904	965

Small credits are put at the disposal of the "kmeti" to buy themselves free, but the Government never favoured this, because the antagonism between the "kmeti" and the landowners was part of its policy. Of course, as long as the "kmet" has to cultivate the ground that does not belong to him, he has no interest in developing intensive culture, nor in improving the soil, because that would only raise the value of the ground he hopes to buy free.

The Slovene population is also chiefly occupied in agriculture, although the Slovene lands allow even more scope for forestry and cattle raising. The number employed in these occupations is easily seen when we state that in 1903 there were in these lands 875 factories, employing 68,000 people.

The Slovenes live in a territory of about 9,650 square miles, of which 3,860 square miles are in Carniola, 1,158 square miles in Carinthia, 3,088 square miles in Styria, and 1,544 square miles are in Istria.

This territory is divided as follows:—

	Ploughed land.	Meadows and grass land	Vineyards.	Forests.	Uncultivated.
	per cent.	per cent.	per cent.	per cent.	per cent
Styria	20	23·8	1·4	47·9	6·9
Carniola	18	32·0	1·5	44·0	4·5
Carinthia	15	27·5	—	48·5	9·0
Coast land	15	41·0	7·5	30·0	6·5

The ploughed land was cultivated, in 1910, as follows :

	Hectares.		Hectares.
Clover	65,062	Mangelwurzels	45,814
Wheat	62,851	Oats	32,523
Potatoes	49,648	Barley	19,965
Maize	49,213	Hops	2,821

The result of the harvest in 1910 was as follows :—

	Hectolitres.		Hectolitres.
Clover	2,550,668	Barley	311,635
Maize	901,630	Lentils	344,262
Oats	873,224		Tons.
Wheat	806,371	Potatoes	149,990
Rye	730,298	Mangelwurzels	205,204

The holdings are small in the Slovene land, and are usually included in some larger properties, generally forests. In Styria, the average holding is of 18 hectares (45 acres), in Carinthia, 20 hectares (50 acres), in Carniola, 7 hectares (17½ acres), and in Istria, 3 hectares (7½ acres).

The Dalmatian population also is chiefly agricultural (about 85·7 per cent.) and the figures showing the average cultivation of the land between 1903 and 1912 are as follows :—

	Hectares.	Acres.		Hectares.	Acres.
Wheat	28,401	71,002	Maize.... .	42,772	106,930
Rye	6,418	16,045	Potatoes	5,694	14,235
Barley	21,275	53,187	Vines	75,501	188,752
Oats....	3,760	9,400			

By far the most important occupation, therefore, of the whole Southern Slav people is agriculture, and the following comparative figures show the results of the harvests for an average of the period 1899 to 1903.

	Tons of cereals.	Lbs. per head of population.
Serbia	975·2	833·14
Croatia Slavonia	1,026·4	913·71
Bosnia and Herzegovina	423·0	541·48
Dalmatia	58·1	214·96
Carniola	77·4	334·66
Styria	312·4	504·01
Carinthia	90·5	541·41
Istria	22·7	143·57
Goritza-Gradishka	27·5	258·23

The agricultural character of the Southern Slav countries is emphasised if the Serbian provinces of Hungary are considered. It is not possible to give a direct and true statistical estimate, but if a proportional estimate is worked out for those lands inhabited by Serbs, on the basis of the Hungarian statistics as a whole, then we find the following figures :—

	Tons.		Tons.
Maize	1,930·0	Barley	83·0
Wheat	1,200·0	Rye	58·0
Potatoes	300·0	Wine (in thousands of hectolitres)	580·0
Oats	240·0		

After agriculture, the most important occupations of the Southern Slavs are, besides vine and fruit growing, cattle raising and forestry, occupations which are closely connected with agriculture.

Cattle Raising.—Cattle raising is carried out in different ways in these different lands, by more advanced methods, as in the Slovene lands and Croatia and Slavonia, or in a primitive manner as in Bosnia and Herzegovina and Dalmatia.

But the results are, relatively, great, and as we cannot enter into any details we will give figures.

In Croatia and Slavonia the number of domestic animals was as follows :—

	In 1895.	In 1911.
Cattle	908,730	1,134,857
Pigs	882,973	1,164,022
Sheep	595,902	850,485
Horses	311,359	305,050
Goats	22,418	95,598

The number of cattle in the Slovene lands is not easy to determine, but according to the statistics of 1910 they were as follows :—

	Pigs.	Cattle.	Sheep.	Horses.
Styria	836,520	683,443	120,246	62,408
Carinthia	185,595	222,383	95,250	30,020
Carniola .. .	177,000	227,000	24,000	40,000
Coast land .	111,649	138,606	228,236	13,104

In Bosnia and Herzegovina, the number of domestic animals in 1895 was:—

Sheep.	Goats.	Cattle.	Pigs.	Horses and mules.
3,230,720	1,447,049	1,417,341	662,242	239,626

In Dalmatia, the number of domestic animals in 1910, was:—

Sheep.	Goats.	Cattle.	Pigs.	Mules and donkeys.	Horses.
1,027,747	254,896	104,716	70,849	42,670	26,520

An estimate of the number of domestic animals in the Serbian provinces under Hungary was as follows:—

Sheep and goats.	Pigs.	Cattle.	Horses.
1,900,000	1,300,000	839,000	516,000

Forests.—The Southern Slav lands include some countries which are famous for forestry, and this is a very important occupation of the population at present, and especially for the future. The most important forests are in the Slovene lands; Bosnia and Herzegovina; Croatia and Slavonia. The following are the statistics:—

Slovene lands.—It is estimated that the forests in those parts of the following provinces inhabited by the Slovene people only, amount (in hectares) to:—

	Private forests.	State and Communal property.	Total.
	hectares.	hectares.	hectares.
Carniola	331,699	110,268	441,967
Styria	240,153	26,129	266,282
Carinthia	158,039	43,319	201,358
Coast land	46,291	40,187	86,478

The production of these forests in 1910 (in cubic metres) was as follows :—

	Timber.	Firewood.
	cubic metres.	cubic metres.
Carniola	578,150	677,280
Carinthia	459,812	378,576
Styria	293,000	461,900
Coast land	30,892	247,868
Total	1,361,854	1,765,624

The forests in Croatia and Slavonia are very important. The timber is of very good quality and there are over 840,000 acres covered with oak alone, and 435,000 acres covered with black pine. But the forests are badly cut by holders of concessions, and in 1907 two-thirds of the forests marked for improvement were not touched.

The pre-war statistics relating to these forests were as follows :—

Total area covered by forests (in hectares).	Annual production (in cubic metres).	Value in kronen.
1,496,029	5,092,900	70,821,295

The statistics relating to the forests in Bosnia-Herzegovina are (in hectares) as follows :—

	State property.	Per cent. of State property.	Private property.	Per cent. of private property.
	hectares.	per cent.	hectares.	per cent.
Full grown	1,436,584	71·9	121,827	21·2
Undergrowth	374,376	18·7	185,279	33·6
Shrubs	186,985	9·4	225,086	40·8
Total forest belonging to the State.	1,997,945 hectares = 78·4 per cent. of the total forests.		532,192 hectares. Total private forests = 21·6 per cent. of total forests.	

The total ground covered by forests, including that belonging to the Church :—

2,530,137 hectares, which is 50 per cent. of the whole area of these territories.

The export trade in timber and wood from Bosnia and Herzegovina, in 1904, was as follows :—

	Tons.	Value in kronen.	Value in £.
			£
Firewood	70,216·2	477,470	19,894
Timber	405,961·7	22,465,788	936,074
Total export	476,177·9	22,943,258	955,968

Industries.—We are now able to judge, bearing in mind what has been said about the occupation of the Southern Slav population at present living under Austria-Hungary, that there is not much room left for industry, and only a small proportion of the people is so employed. In this connection we shall quote only a few figures for the most important countries.

In *Croatia* and *Slavonia* the number of people employed in industry in 1910 was 88,250. The importance of metallurgical industry is small, and there are only about ten factories of any importance. The manufacture of stone-ware, pottery and glass-ware employs 5,600 workers. The largest factories are those dealing with wood and bone, in which 17,500 workmen were employed in 1910. In 1903 there were thirty-three large steam and ten electric motor and hydraulic saw-mills.

According to the latest statistics, the value of the total output of the larger factories in Croatia and Slavonia was :—

	£
Foodstuffs	2,908,750
Wood and bone articles	1,328,333
Stone-ware, pottery and glass-ware	806,500
Textile goods	557,833
Chemicals	541,125
Leather goods, brushes, &c.	448,791
Paper	161,083
Iron and metal goods	86,958
Machinery	77,958
Clothing....	49,416

The Slovene industries also are very little developed and the capital invested in them was largely German. In 1910, of 190 millions' worth of capital so invested, 172 millions were German money.

The most important industry, connected with the natural resources of the country, is that of wood sawing. In the Slovene countries there are 2,704 water-mills, of which 111 are driven by steam power and the rest by water power. Besides this, there are twelve furniture factories and twenty-five paper and pulp factories.

Mining.—The mining industry is very little developed in proportion to the mineral wealth. In *Croatia* and *Slavonia* the soil must be rich in minerals, but their exploitation is very limited. About some 4,000*l.* worth of *iron ore* is obtained annually.

In the Slovene lands the soil is also rich in minerals, but they are at present far from being exploited to their full extent. In 1910, the comparison between working mines and unworked mines was as follows:—

	Coal.	Lead.	Iron.	Antimony.	Manganese.	Quicksilver.	Aluminium.	Copper.
Worked	23	9	1	1	1	1	1	—
Unworked	45	34	8	2	3	3	2	5

In 1910, 11,239 workmen were employed in these mines, and the production of ore and coal amounted to over 19 million kronen.

It is interesting to consider what became of the famous Bosnian mines of the Middle Ages.

The results obtained to-day are nothing to compare with what could be achieved in Bosnia and Herzegovina, when the mineral riches of the soil and the amount already worked are considered.

In 1905, mining production was as follows:—

	Production.	Value in kronen.	Value in £.
	Hectolitres.		£
Salt	1,947,607	177,090	7,378
	Tons.		
Coal	540,236	2,381,195	99,216
Iron	127,525	760,039	31,668
Sulphur	19,045	380,900	15,870

Industries were not developed in the Southern Slav lands under Austria-Hungary because of the same reason which prevented them attaining the full capacity of production in any branch of their economic life, namely, because these countries did not possess a national economic organisation.

The aim of Austria was to leave this people in such a primitive stage of economy as to render them an absorbing ground for the industrial production of the German and Hungarian population, and to develop only those industries which would help to exploit the natural riches of the soil, and the mineral wealth of these lands, and the working capacities of their people. This principle shows itself in all the figures representing the economic condition and state of this population.

This plan was achieved by different methods. The chief are as follows:—

1. In agriculture, to favour the large proprietors who were chiefly foreigners established in the country, or owners of land by Turkish law, as in Bosnia and Herzegovina. The small proprietor was in a very difficult position because he had no facilities for obtaining capital and credit, and was handicapped by those who had capital. Only latterly in some of the Southern Slav countries co-operative societies with a national character have been formed with great difficulty to afford credit facilities to the small proprietor. Under these conditions large numbers of the Southern Slav population emigrated especially to America. It is estimated that about 800,000 Southern Slavs are living in America and the British Colonies and Dominions. Nevertheless, as a result of this policy, while it was difficult for the Southern Slavs to make progress in agriculture on small holdings, foreigners, Germans and Hungarians, found it very profitable to settle into agriculture in these countries. The Government of Austria-Hungary, again following the same plan, favoured such settlement, so that to-day colonies of Germans and Hungarians are found in the Southern Slav countries possessing the best land under special Government auspices.

2. The scarcity of capital made any development of national industries, *i.e.*, industries with Southern Slav capital, very difficult, and even when that was possible it was not favoured by the Government, and all possible difficulties were put in the way, of which the chief was that the export of these products into the rest of the Southern Slav lands was hampered, and German and Hungarian industries were given facilities to penetrate into these lands. Even when German capitalists wished to invest in industries in the Southern Slav countries, Austria thought it wise to advise them not to do so, because of the danger of creating large centres of industry in the Southern Slav countries, to the detriment of the German and Hungarian industrial centres in Austria-Hungary. Only one kind of investment was favoured, that was the exploitation of the natural riches of the Southern Slav countries by foreign capital, especially those of forest and mine. Concessions in these directions were always forthcoming with much greater facility for foreign capitalists. As a result, the Southern Slav in Austria-Hungary, if employed in industry, was merely a lower-class labourer

and his standard of wages was lower than that of the Hungarian or German worker.

3. The economic communications are organised in such a way as to emphasise and assist the whole scheme already explained, and the railways and ports were constructed with this object. It was always Austria's first idea to connect by the best and shortest route the German and Hungarian industrial centres with the sea, and to create the best outlet for their products. She also sought to provide good means of penetration into the Southern Slav lands. But for the export of the products of these lands there was no provision. It was to the Government interest to retain the raw material for the industries of Austria-Hungary.

For all these reasons the railway lines were never constructed to favour the economic development of the Southern Slav countries. On the contrary, they were planned so as to leave these countries unconnected and isolated from Serbia. When this idea could not be carried out in its entirety, *i.e.*, when a railway line was constructed which suited the German and Hungarian interest and accidentally was also to the economic advantage of the Southern Slavs, then a special tariff system was arranged which favoured Hungarian and German interests. On the railway line, Budapest-Zagreb-Fiume, the tariffs were regulated in such a way that passenger rates and freight were the same from Zagreb to Fiume as from Budapest to Fiume, which is nearly twice the distance.

Merchants in Osek (Slavonia) find it an advantage when sending goods to Bosnia-Herzegovina, to dispatch them first to Budapest and then to re-dispatch them to Bosnia-Herzegovina, increasing the distance by 500 kilometres, but reducing the freight, because it is cheaper to send goods from Hungary to Bosnia-Herzegovina than it is to send them from one Southern Slav country into another.

4. Finally, the general reason why the Southern Slav countries could not develop their national economic organisation was because they were incorporated into a foreign state. Under such conditions, though it was sometimes possible for private people to achieve great prosperity, such prosperity did not benefit the national welfare of the Southern Slavs. Indeed, any revenue resulting from that prosperity was spent in developing the economic organisation and national prosperity of Austria-Hungary, and was in direct opposition to the interests of the Southern Slav race.

Economic unity and independence achieved, the national economic development of the Southern Slavs becomes possible. Their economic independence will be realised by the possession of the natural channels of communication in the countries inhabited by the

Southern Slavs. It is easy to realise what these are if the geographical position of these countries is considered. The whole country is divided by two axes of natural economic communication. The one from the West towards the East formed by the valleys of the rivers Save and Danube; the other from the North to the South, formed by the valleys of the rivers Morava and Vardar. These two natural lines of economic communication cross each other and are bounded on the South-West by the Adriatic Sea. To render them completely effective—economically—they have to be brought into communication with the Southern Slav ports in the Adriatic, as was the case in the Middle Ages. The control of these economic roads gives to the Serbian (Southern Slav) race the possibility of a national economic development which is full of the finest prospects. It would be easy to visualise that future, if we would calculate the future development on the basis of the total Southern Slav population, and by adding the different economic resources of the Southern Slav countries which we have already presented. We will not do this, however, because we are convinced that a new and important economical development awaits the Southern Slavs when they are economically free and united, which will far exceed their isolated achievements in the past.

After this statistical study of the economic development of the Southern Slav nation, as a whole, it would be interesting to give statistics showing the Serbian losses in this War.

Unfortunately, it is as yet impossible to give figures which would include all damage and loss, as these have not yet been officially estimated, owing to the complete devastation of the country by the enemy, and the lack of staff and communications.

At present a Commission is working on this, but though no figures are yet available, two points can be emphasised:—

1. It has already been established that by enemy occupation the whole economic organisation has been destroyed. All industrial plant has been dismantled and removed, raw materials also, and public and private mobile property stolen or commandeered for enemy use. Cattle and agricultural implements have been treated in the same way. In fact, the enemy, during his occupation, stripped the country of almost everything, and during his retreat deliberately despoiled and laid waste anything still left to destroy. Communications by road and rail have suffered to such an extent that it will take a considerable time to rebuild them.

2. At the same time, although the economic wealth of the country has been so enormously reduced, the National Debt has

considerably increased, for Serbia had to re-arm and re-organise her army, maintain this army, feed the civil population which managed to escape, pay the salaries of the officials and their families who remained in Serbia and help her prisoners in enemy hands. All this Serbia had to do, despite the fact that during almost four years she had no Public Revenue whatsoever, and the National Debt which she had to contract in order to continue the War amounts at present to 2,400 millions. This, when added to that contracted prior to 1914, is quite out of proportion to the Revenue.

Besides these material losses, Serbia had, through the War and enemy occupation, to sustain tremendous losses in *lives*. It is as yet impossible to ascertain the exact total of these losses, but some figures have been officially established.

According to information from the Serbian Ministry for War, Serbia, from July 25, 1914, to July 14, 1916, placed 707,343 men in the field. During the whole of this period she maintained a force of 500,000 effectives. The number of men mobilised amounted to 24 per cent. of the entire population within the old frontiers of Serbia. Only about 100,000 men were drawn from the new provinces. In the two great Austrian offensives in 1914, the number of men killed in battle was 45,061, and the number of deaths from wounds and sickness 69,022. In 1915, the number of deaths from sickness was 56,842. Total number of deaths from all causes was 171,725.

At the time of the retreat 139,000 wounded were left behind on the battlefields and in hospitals or sent home disabled or for convalescence, all of whom were taken prisoner by the enemy. During the retreat across Albania 150,000 men perished.

The last call-up (old men) and part of the third call-up amounted together to 100,000 men. They remained in Serbia and were taken prisoner by the enemy. The remnant of the Serbian armies, taken to Corfu, Bizerta and France, amounted to 150,000.

According to the official returns, the number of those fallen in battle and dead in captivity, up to the last Serbian offensive, amounted to 320,000, which means that one-half of Serbia's male population, from 18 to 60 years of age, perished outright in the European War.

In addition to the above figures, it has been estimated by the Serbian Medical Authorities that about 300,000 people have died from typhus among the civil population, and the losses among the population interned in enemy camps are estimated at 50,000. During the two Serbian Retreats and during the Albanian Retreat the losses among children and young people were enormous, and are estimated at 200,000.

Lastly, during over three years of enemy occupation, the people had to live under a régime specially organised for the extermination of the Serbian population. Owing to this fact, and the lack of proper food and medical attention, the losses in lives during this period are estimated at 250,000.

It should also be remembered that during this time, the Serbian birth-rate was much reduced, so that the Serbian losses in lives must certainly much exceed 1,000,000, or over one-third of the population of the Serbian Territories of 1912.

DISCUSSION ON DR. DIOURITCH'S PAPER.

PROFESSOR EDGEWORTH, in proposing a vote of thanks to the author, said that Dr. Diouritch had given them a most instructive exposition of national progress. How soon that progress had begun, many of them had perhaps not realised. One read with wonder of the factories, industries and exports at an early stage. That flourishing period before the Turkish domination in Serbia had verified Hume's thesis that refinement or skill in the arts was very consistent with, or even favoured, military prowess. The existence of the martial spirit in Serbia required no proof. It was too fresh in their grateful thoughts. If any proof were required, they had only to consider those tremendous statistics which had just been read out to them at the end of the Paper. Half the adult male population had been killed, if not actually on the field, yet as a direct consequence of military operations, besides other losses. If they included, as De Foville had recommended in his account of the 1870 war, those who failed to be born, they came to the stupendous result that one-third of the Serbian population had been lost in this war. They hoped that prosperity, which had been so well deserved, would now be commanded. In view of that future prosperity which the reader had suggested, there was one feature which might seem foreign to some English readers. He referred to the association of economic progress with national life and political action. They continually read of national economic organisation and expressions of that kind. Progress was associated with the acquisition of territory, natural channels, and so forth. Such considerations were not much dwelt on by Newmarch and Tooke and the older members of the Statistical Society. But if Great Britain had a neighbour such as Austria thwarting her in the three or four ways that Dr. Diouritch had described, perhaps those considerations would have been more prevalent. A perfectly Cobdenite view of affairs could hardly be possible, he thought, in conditions such as Dr. Diouritch had very temperately and without any tone of passion put before them. Still he (the speaker) wished for unprotected and unrestricted trade as far as was consistent with common-sense. He trusted that the Serbians in whatever new territory they might acquire would be disposed to act in the spirit which had been lately voiced by two leading Italian economists, Professors Prato and Einaudi. In a Report presented to the Italian Branch of the League of Nations, they expressed very strongly their hope that in any new territory which Italy acquired, for instance, Trieste, there might prevail perfect freedom of opportunity for all other nations. That was the spirit, he thought, in which the acquisition of territory by others could at least be tolerated by those who would prefer to have it themselves. But while touching on such topics, one could not conceal that there was perhaps something unrealisable by the merely statistical or economic mind in the relation between war and political economy. One of the most pacific and distinguished of American economists, Professor Taussig, even before the war had turned attention in those directions, and expressed his belief that there was something in the martial spirit not unconnected with economic progress.* Such economic progress had often followed very closely upon military success. To these general considerations he would only add a few questions about particular points. The author had alluded to the mortality in Serbia, and observed that it was specially great at the infantile period. There was also something at the senile period which he had found rather puzzling. The author gave the mortality after 60 years in three different epochs, and the mortality was very much greater in the third epoch, more than double what it was in the first epoch. Any further remarks which Dr. Diouritch might make with regard to peasant properties would be of interest. When speaking of those properties under Austria, he seemed to think they had a shadow side. Again, the neglect of the Serbian forests in the past suggested a question. Was there here an illustration of Sidgwick's remark that forests formed one of the instances in which the interest of the individual proprietor does not coincide with that of the nation?

Mr. T. T. S. de Jastrzebski, in seconding the vote of thanks, said it seemed to him that Dr. Diouritch had had a most difficult task in making a choice as to how he should cut down his material and present it, as the field was so great. He thought he could very properly assume that the ignorance of his audience would be as vast as the field he had to cover, because he (the speaker) thought that most of them could without hesitation with their hands upon their hearts lay claim to a monumental ignorance of Serbia and Serbian history. Whether it was in consequence of his name that he had been asked to second the vote of thanks in the vain hope that a name like his might possibly connote some knowledge of Serbia or not, he did not know; but his actual knowledge of Serbia was confined to the fact that in the year 1849 his father had tramped from Shumla to Cettinje as a refugee after the flight across the Danube of Kossuth's last army. He was an officer in the Polish Legion under General Wysocki. As a small boy he could remember listening to his father telling him some incidents that happened to him while he was there. The only real clear recollection he had was that he always had been told that the Serbian population was a population with the greatest love of liberty, and the most profound sense of their national existence of any people in the whole of Europe, not even excepting those of his own unfortunate country—Poland. Turning to the Paper itself, there were one or two points he wished to touch upon. The first, as to the population, was exceedingly interesting, because if they looked at the figures given they would find that there was always a preponderance of males. The preponderance of males was kept all the way through, which was a very rare and extraordinary thing among European populations. At all ages the males preponderated in Serbia, so that up to the present war at any rate they never had that terrible problem, which had so exercised their friend, Dr. Snow, of what he had most ungallantly called the superfluous spinster. That was due to two causes. In the first place, the sex ratio of birth in Serbia showed a relatively high male plurality. For the years 1876 to 1910 the ratio was 1057 of males to every 1,000 females. That was compared with a ratio in this country up to the war of 1038. On the other hand, the female mortality was higher in Serbia than the male mortality. He thought it was generally held that where the female mortality was higher than the male it argued ill for the social progress of the people in question, because as one probably knew, in this country at any rate, male mortality was relatively much higher than female mortality. They had probably the highest relative male mortality of any country in the world. In Serbia it was the other way round, so that they had two causes operating to keep the male population preponderating. On the whole, the Serbian race seemed to have been relatively prolific. He had looked up to see what was the relative fertility as given in the last volume of the International Institute's publication, and had calculated that children born to women between 15 and 49 for the years 1896 to 1905 in Serbia were 173 as against the rate in England and Wales of 104; while, if they excluded the unmarried, the widowed and the divorced, and calculated only on children born to 1,000 married women in those ages in Serbia, it was 236, as against 203 in England and Wales. They would therefore see that the Serbian population was a distinctly interesting one. He asked Dr. Diouritch to assure him whether the Serbian statistics were reliable. He had told them very emphatically that Austro-Hungarian statistics were unreliable and doctored, and that Turkish statistics were not to be considered statistics at all. In trying to study Serbian populations, he would like to have the assurance that he could take it that the Serbian statistics were actually reliable in themselves. With regard to the Paper itself, there was the question of the occupation of the population as showing the progress of the country. The first thing he noticed was that between 1900 and 1905 the biggest rise in the occupation was in the Government officials. Was that a sign of progress in the country or not? There was no other occupation which had made such tremendous strides in those five years as that of Government officials. Speaking as an official himself, he did not know whether an undue excess of the parasitic growths of the country was an altogether desirable thing; and he trusted that that kind of progress was not going on at the same rate, because, if it did, in another century the agriculturists would occupy the position which the Government officials did before the war and the Government officials would occupy the position of the agriculturists, and after all they could not live indefinitely on taking in one another's washing. He was doubtful whether Professor Edgeworth had interpreted Dr. Diouritch's view on the question of small holdings. After all, the progress that free Serbia made—and it must be remembered that free Serbia only meant Serbia since 1878—seemed to him to nave been mainly due to the fact that 90 per cent. of its population were holders of their own land. The prosperity of a people depended more on the proportion of the nation who had ground which they could call their own than anything else. It was probably due to that and not to economic success, and to the fact that Serbia for four centuries was struggling continually to keep her soul alive against the dominion of the Turk that they saw the martial spirit of the Serbs. He wished to have explained some of the figures; for instance, on page 302, the land under cultivation. In 1897 the total amount given was 2,527,000 hectares. In 1905 apparently it had fallen to only 2,000,000: there must be some mistake in the figures. The conclusion Dr. Diouritch said was to be drawn was that the area cultivated of the freed lands had much increased and that would diminish lands and forests. The conclusion one would naturally draw was that the area of the cultivated land was decreased to an enormous extent. He could not quite understand how it was in the two tables, if there were 1,167,000 hectares under cereals in 1907, they only produced 366,000 tons, whereas with a drop of 47 per cent. apparently in the following year under cereals there was a rise of 25 per cent. in the production. If that were due to improvement in agricultural methods, it was really a remarkable and brilliant success, but he thought there must be some figure slipped somewhere. After all, it was the last few paragraphs of the Paper which interested them most. Had there ever been in modern history such a record of heroism as was set forth in those few bald unadorned sentences with which Dr. Diouritch had concluded his Paper? When one reflected that after having the enormous weight of the German, Austrian and Bulgarian invasion thrown upon them, after that ghastly retreat through Albania, which should have demoralised and disorganised and ruined any military organisation in the world, that the 150,000 Serbian survivors should have been capable of being brought together as a living army again, and should in the end have performed that epic feat of their last great attack, when they swept the Bulgarians, like chaff before the wind, literally from one end of the country to the other. And what a country it was across which they swept them; he did not believe himself that, great as had been the achievements of every one of the Allied Armies during the war, heroic and super-heroic as had been the deeds of every nation that had taken part, there had been anything done in the whole course of the war which could be compared with that last grand sweep of the Serbian Army. He asked them to think what they had passed through. To think of the indomitable spirit of those men, and to think of what the little country had suffered, not only in this war, but through the centuries, in the name of their own liberty. They had valued their own national existence beyond everything, beyond home, limb or life. Everything had been given to preserve Serbian nationality and Serbian liberty. It was to the Little Nations after all that they had to turn for the brightest example of the flame of the worship of liberty, the greatest good that man could have: and he thought that they all felt the debt that they owed to Serbia was an incalculable one. Small the nation might be, few and scattered its people, but when the impartial eye of history summed up the great European War of 1914 to 1918, was there any of the countries that took part which had played a more glorious role than Serbia?

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* Presidential Address to the American Economic Association, 1905.

Mr. E. A. BRAYLEY-HODGETTS asked a question with regard to the land tenure. Dr. Diouritch had said that the land was owned by private holders. Did that mean that there was no communal land system? He was under the impression that in most of the Slavonic countries the system of communal land prevailed.

Mr. J. W. WILES said that as one who was in Serbia before the war and at the beginning of the war, and also during the last phases of it, which had been so eloquently referred to by Mr. de Jastrzebski, he wished to express his gratitude at being allowed to be present to hear the Paper read. He had come up from Serbia the whole way from Salonica to Belgrade, and beyond Belgrade to Austria by road early last November, and he would never forget it. He was filled with admiration, and more than admiration, even love and affection, for the Serbian people, perhaps most of all for the bravery of the women. He had many talks with them, as he was able to speak a little Serbian. As reference had been made to communications, he wished to refer to the merciless destruction of the Serbian railway, which he had seen. For practical purposes there was no railway at all from Vrangae right away to Belgrade, which represented the old frontier before 1912. The Germans had ripped it up mercilessly and had ruined the railway stations and blown up every culvert. It would be a long time before it was put right. He wished to say that the great demand now was for English men of business to go out to Serbia. He hoped some would go out and spend their holidays there, if they could. There was a great demand for English building firms, and in many other ways.

Mr. E. R. P. Moon said perhaps he might be allowed to put one question in addition to that of Professor Edgeworth with reference to the mineral resources of Serbia. They had heard about gold and copper. He rather gathered that the working of them had been discontinued, but probably Dr. Diouritch had some view as to whether the minerals were found, as they called it in South Africa, in " payable " quantities.

Mr. Frank Hastings wished, as a visitor, to express his gratitude at being allowed to be present. He was sure they had all been much impressed by the very carefully prepared Paper which Dr. Diouritch had given them. With regard to the part of the Paper as to mortality, speaking on behalf of the Serbian Red Cross in Great Britain, it was the duty of that Society in some way to endeavour to mitigate the terrible sufferings which were going on in Serbia amongst the children. In that room there was one of the super-heroes who had been referred to, and he assured them that if they in any way could do something to help, nationally, the women and children of Serbia at this time the Serbians themselves would have the greatest gratitude for it. It would be an enormous advantage if help could be rendered to the Serbian Red Cross Society in this country so as to help the women and children. Dr. Diouritch had given them some very valuable statistics with regard to the trade of the country, but what he felt was that their own country should come into closer association with Serbia. He thought the Government should endeavour to provide greater facilities for their merchants and should endeavour to provide ships which should take goods from this country to Serbia and back from Serbia to this country. It was what might be termed preferential rights. There was the Commission Internationale de Ravitaillement, which had been giving very valuable facilities for the transfer of goods for Red Cross purposes, but he felt that it would be of great advantage to Serbia if their own Government would encourage a commercial mission from Serbia to this country and from this country to Serbia, in order to bring before the British Empire her resources and enable them to get into touch with their own merchants, in order that Serbia might feel that she was getting some real substantial help from the British Empire once more to reconstruct herself and to rehabilitate her population.

Mr. O. Pelly Dick said, with reference to what Mr. Hastings had just said, that the British Government had arranged to send out an Economic Commission to Serbia, the first part of which was now working in Serbia, and a further part would be going out in about a month's time, which dealt with various branches of English industry and agriculture.

Captain Goodwin said that whilst he had been talking with various English people since he had been back in England, they had asked what proportion of the Serbian people were in any way educated. Particularly, business men said that if they were going to deal with them they wanted some idea of the number of educated Serbians.

The President said he might perhaps be allowed to add his voice in expressing the thanks of the Society to Dr. Diouritch for the exceedingly interesting Paper he had given them. It was a Paper that had supplied them with much information on a little-known subject. The discussion which had followed it had evoked several expressions of the intense sympathy with Serbia in the trials through which she had passed. and the admiration for the heroism of her population, which were widespread amongst the British public. The first part of the Paper struck the hearer as perhaps containing a number of statistics on rather a small scale; but when it was remembered how recent the industrial development of Serbia was, the surprise was rather that she should have already proceeded so far. It was only in 1884, as Dr. Diouritch told them, that the first railway was built. Until then she had not even completed a line of railway; and when they realised that for centuries she was under the blight of Turkish rule. and that afterwards she had had the unhappy and injurious economic conflict with Austria-Hungary, which for several years crippled her trade seriously, they were filled with admiration at the great efforts which her population had made to build up a sound economic system. During the last few years she had undergone the utmost devastation of war. As had been mentioned by previous speakers, the statistics at the end of Dr. Diouritch's Paper were perhaps the most striking of all. To think that in these modern times half the adult male population of any country should have been destroyed within a few years was terrible; and if they added the mortality which was due to typhus and the high infant death-rate to the deaths of prisoners, even excluding the children unborn through the fall in the birth-rate, they had a total, according to the figures presented to them in the Paper, in the neighbourhood of 900,000 deaths directly due to the war. If those figures were accurate, it appeared that Little Serbia had lost as many human beings in the war as the whole of the vast British Empire; and when they realised how heavy they themselves had felt the casualties in the war in this country and how many had fallen from among the population of their great Dominions, and contrasted the 400,000,000 of the British Empire with the comparatively insignificant population of Serbia, then indeed they had some measure of what the calamity had meant to her. They would, however, trust that now with her greatly enlarged territory, with fresh economic outlets, there would be a revival of her agricultural development and of her industry, and a growth of her prosperity. They all hoped that now Greater Serbia, the Triune Kingdom of Serbs, Croats and Slovenes, would be in the days to come one of the most prosperous and most happy of the European family of nations.

A vote of thanks was then passed unanimously to Dr. Diouritch.

Dr. DIOURITCH, in reply, stated that he thought it would be necessary to say that all the questions really proved that his lecture on the economic development of the Southern Slavs was incomplete. His idea was to give a general economic survey and he was handicapped very much by the limited space allowed him. He was asked to write something to the extent of 25 pages He was afraid it was much longer; but there were a lot of points he was unable to treat, and he thought it would be very interesting if in the future a special study could be made of some of those points. With regard to Serbian statistics, he must admit that he was afraid they were as uncertain as many other statistics. He found one thing especially which would apply, he thought, to every peasant country: that directly statistics regarding land, production and livestock were demanded from the peasants they thought it had something to do with taxes and were very careful indeed not to over-estimate their livestock and the production of their land. The unreliability of the Hungarian statistics to which he referred is of a different character. It was to the political interest of Austria-Hungary to misrepresent the true conditions of the Serbs living under her domination. As far as births and deaths went, he thought Serbian statistics were reliable. The only point that was not certain, and which would be only noticeable if the population were studied in detail, was the different diseases and their cause, owing to the lack of medically trained people. Another point raised was as to communal property. It was quite true that all the Serbian countries were typical examples of communal property, but when he spoke of every peasant being the holder of his land, he meant to point out the disappearance of the mediæval system of holders and proprietors. He thought it would be very interesting to take up that question and study it statistically, because he thought communal property played an exceedingly important role in keeping up the national spirit and preserving the Serbian race during five hundred years of foreign occupation, and not only occupation, but dominion by a barbarous race who really wanted to destroy it. He was afraid that communal property had lost much of its interest in the present day, and he thought agricultural co-operation was the thing they must look to. As to the question of Serbian educational statistics, he was afraid he could not say much. He had explained how difficult it was: that Serbia in 1830 was really a primitive Turkish province which was set free, and that primitive Turkish province had no national roads and did not possess economic organisation of any sort; no national currency, no credit, and no public finance. Public education was non-existent and had to be wholly organised in the same way as other public institutions. Progress in this direction had been relatively very great, considering that in 1830 Serbia was practically an illiterate country, but to give statistics as to this would open up a question which, besides being prohibited by the limitations of space, would be outside the plan of his Paper.

The following Candidates were elected Fellows of the Society:—

R. Ramaswamy Aiyengar, B.A.
J. E. Allen.
Arthur R. Crathorne.
Sir Edward H. Holden, Bart.
Richard D. Holt.
F. W. Lanchester.
George A. Pavlovsky.
Ibrahim Rashad.
Sir Felix Schuster, Bart.
Joseph Edmund Stone.

THE MEASUREMENT OF CHANGES IN THE COST OF LIVING.

By A. L. BOWLEY, Sc.D.

[Read before the Royal Statistical Society, Tuesday, April 15, 1919, the President, the Right Hon. HERBERT SAMUEL, in the Chair.]

IN this Paper I propose to deal with methods rather than with results, since there is great confusion and variety in the methods by which questions of prices and cost of living are approached, and till the problems are analyzed and the terms defined we are not likely to be able to make a good use of the mass of material accumulating at home and abroad as to the movement of retail prices and as to family expenditure. At the same time, I propose to illustrate the methods by the use of the budgets collected for the Committees on the Cost of Living, viz., Lord Sumner's Committee, which reported in October, 1918, on the urban working-classes of Great Britain (Cd. 8980), and a Committee of the Agricultural Wages Board, which reported on workers in rural districts in England in March, 1919 (H. of C., No. 76 of 1919).

It is now generally recognized that "Cost of Living" is an indefinite phrase, and it only becomes explicit when it is expanded into "The cost of maintaining a defined standard by a defined family." The phrase "Change in the Cost of Living" is even less definite, for we have to consider the change in the standard and the change in the constitution of the family as well as the change of prices, and the same considerations apply whether we are comparing the position of families in two countries, or at two dates in the same country, or in two social classes.

One of the ways of measuring change in cost of living has been to form an index-number of retail prices, and by means of it estimate the rise in the cost of living, and inversely the change in the purchasing power of money. This method leads to a fairly satisfactory means of translating movements of money wages into movements of real wages, but can only be applied to that part of the general problem which is concerned with movements in one country in a period when changes are not rapid, and easily leads to misleading and absurd results in times of acute disturbance of prices and supplies.

The data for the measurement of the change of the cost of living, however it is defined, are always of the same nature, and consist of records of the quantities of various commodities bought and the prices paid for them at two dates or places or by representatives of different social groups. Thus we have given with greater or less accuracy—

Commodity.	Place or date. A.					B.				
	Quantity.		Price.		Expenditure.	Quantity.		Price.		Expenditure.
1	Q_1	×	P_1	=	E_1	q_1	×	p_1	=	e_1
2	Q_2	×	P_2	=	E_2	q_2	×	p_2	=	e_2
3	Q_3	×	P_3	=	E_3	q_3	×	p_3	=	e_3
⋮	⋮		⋮		⋮	⋮		⋮		⋮
n	Q_n	×	P_n	=	E_n	q_n	×	p_n	=	e_n

In Tables I and II are shown in this form the budgets used in the Reports named.

TABLE I.—*Urban Working-class Budgets.* (Based on Cd. 8980, p. 18.)

EXPENDITURE OF STANDARD FAMILY.

		1914.			June, 1918.			p/P
		Q Quantity.	P Price.	E Expenditure.	q Quantity.	p Price.	e Expenditure.	Price ratio.
			d.	*d.*		*d.*	*d.*	
1. Bread and flour	lbs.	33·5	1·51	50·5	34·5	2·36	81·5	1·56
2. Meat	,,	6·8	8·6	58·5	4·4	18·6	82·0	2·15
3. Bacon....	,,	1·2	11·7	14·0	2·55	26·1	66·5	2·24
4. Lard, suet, &c.	,,	1·0	7·5	7·5	·78	17·9	14·0	2·29
5. Eggs	No.	13	1·0	13·0	9·1	4·0	36·5	4·00
6. New milk	pints	9·2	1·8	16·5	11·7	3·0	35·5	1·69
7. Condensed milk	tins	·25	6·0	1·5	·59	14·5	8·5	1·42
8. Cheese	lbs.	·84	8·9	7·5	·41	20·7	8·5	2·32
9. Butter	,,	1·70	14·4	24·5	·79	29·7	23·5	2·07
10. Margarine	,,	·42	6·0	2·5	·91	12·1	11·0	2·01
11. Potatoes	,,	15·6	·7	11·0	20	1·25	25·0	1·78
12. Rice and tapioca	,,	1·4	3·2	4·5	1·3	5·8	7·5	1·82
13. Oatmeal	,,	1·3	1·9	2·5	1·4	4·3	6·0	2·24
14. Tea	,,	·68	21·3	14·5	·57	33·3	19·0	1·56
15. Coffee	,,	·09	16·7	1·5	·12	25·0	3·0	1·50
16. Cocoa	,,	·18	19·4	3·5	·23	32·6	7·5	1·69
17. Sugar	,,	5·9	2·2	13·0	2·83	7·07	20·0	3·21
Total		—	—	246·5	—	—	455·5	—
Other food		—	—	52·5	—	—	111·5	—
Total		—	—	299·0	—	—	567·0	—

S. QP = 246·5 S. qp = 455·5 S. Qp = 521·6 S. qP = 225·5

S. e ÷ S. E = 1·90 S. Qp ÷ S. QP = 2·12 S. qp ÷ S. qP = 2·02

TABLE II.—*Agricultural Budget.* (Based on H. of C., No. 76 of 1919, p. 66.)

EXPENDITURE OF STANDARD FAMILY.

		1912.			March–June, 1918.		
		Q	P	E	q	p	e
			d.	*d.*		*d.*	*d.*
1. Bread	lbs.	19·9	1·38	27·5	24·1	2·25	54·1
2. Flour	,,	15·2	1·43	21·7	13·7	2·29	31·2
3. Beef and mutton	,,	3·3	8·0	26·8	3·2	16·5	52·6
4. Pork and sausages	,,	1·1	8·6	9·4	·38	18·0	6·8
5. Bacon	,,	2·1	10·0	20·8	1·9	23·5	45·7
6. Lard	,,	·41	7·0	2·9	·43	19·0	8·2
7. New milk	pints	6·0	1·5	9·0	7·25	2·6	18·6
8. Skim milk	,,	3·0	·5	1·5	3·15	·78	2·4
9. Cheese	lbs.	1·08	8·0	8·6	·43	17·9	7·6
10. Butter	,,	1·04	14·1	14·6	·86	29·7	25·6
11. Margarine	,,	·62	7·0	4·3	·69	12·8	8·8
12. Potatoes	,,	25·75	·5	12·9	24·3	·93	22·6
13. Rice and oatmeal	,,	1·56	2·0	3·1	1·91	5·1	9·7
14. Tea	,,	·51	16·0	8·2	·44	32·3	14·2
15. Coffee and cocoa	,,	·15	12·5	1·9	·21	30·2	6·5
16. Sugar	,,	4·6	2·0	9·1	2·5	6·9	17·3
17. Syrup, jam, &c.	,,	1·6	4·8	7·7	1·5	10·3	15·5
Total		—	—	190·1	—	—	347·5
Other food		—	—	12·0	—	—	25·0
Total		—	—	202·1	—	—	372·5

S. QP = 190·1 S. qp = 347·5 S. Qp = 388·2 S. qP = 173·6
S. e ÷ S. E = 1·84 S. Qp ÷ S. QP = 2·042 S. qp ÷ S. qP = 2·002

METHOD I.—*Index-number of retail prices.*

The theoretical construction of an index-number of retail prices only differs from that of one of wholesale prices, because the purpose of the former is generally to measure the change of the value of money (say 1*l.*) in the hands of a defined class, while the purpose of the latter may either be to measure general changes of purchasing power of money, or more abstractly to ascertain what part of the movement of the price of a commodity is assignable to the change in value of the standard of exchange and what part to causes affecting the special commodity in particular. For the last problem it is held on high authority that an unweighted average is sufficient, but for measurements of purchasing power it is generally agreed that the use of weights is necessary.[1]

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[1] Recent American practice of using "aggregates of money prices" makes a change of method but not of principle.

The precision of an unweighted average increases with (the square root of) the number of independent items included, and is the greater the more the movements of the items averaged are closely concentrated about their mean. Where the movements of the items are not independent (*e.g.*, wheat and flour, coal and pig iron, hides and leather) more must be included to obtain the same precision as that from independent items. It is readily seen that Sauerbeck's index-number from 1898 to 1912 is much affected by the relative numbers of items of food (whose average rose in the ratio 68 : 81) and of materials (whose average rose in the ratio 61 : 88) included ; on the whole the prices of food are interdependent as are the prices of materials, and where the movements of these groups are at different rates, the conditions of accuracy are lost. From 1914 to 1919 the conditions for precision have not been maintained, and we have no guarantee that index-numbers afford a safe guide, and, moreover, the selection of commodities which formed a satisfactory basis in 1914 may no longer be suitable for 1919. The problem has often been compared to that of deducing the proper motion of the sun from the apparent movements of selected stars ; but what is the astronomer to do if some of his stars move off jazzing in constellations and others disappear from the firmament ?[1]

These uncertainties remain when we weight the observations, and further complexities are added, for the alterations both of supply and of demand have affected profoundly the relative importance of commodities, and all the difficulties are at their maximum when we deal with the problems of cost of living ; here indeed statisticians may fear to tread, however bold the representatives of labour.

So far as the construction of an index-number to measure the movement of retail prices in the abstract is concerned, it does not seem at all certain that any improvement is made by weighting, and it might reasonably be advocated that a very large number of commodities—as many as possible—should be selected and the simple average or the median taken. The number would then be of the form—

$$\frac{100}{n}\left(\frac{p_1}{P_1} + \frac{p_2}{P_2} + \ldots\ldots + \frac{p_n}{P_n}\right),$$

or a corresponding formula for the median.

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[1] The difference of the treatment of the price of beet-sugar in 1914–18 in the *Economist* and the *Statist* index-numbers illustrate these troubles. For the *Statist*, see *Journal of the Royal Statistical Society*, 1918, p. 345. The *Economist* assigned a number 158 for German beet-sugar in September, 1914, which was kept unchanged till April, 1918, when it was raised to 193 to allow for the increase of duty on other sugar.

It would not be proper to treat the 21 price-changes shown in the *Labour Gazette* in this way, for the number of uncorrelated entries is much less than 21 and not nearly sufficient for precision.

No one, however, would dare to use this method for any administrative or executive purpose, and it is not worth while to develop it.

When we take a weighted index-number, the method rapidly merges into the next.

METHOD II.—*Change in cost of a constant standard.*

An obvious, and at first sight a valid, way of measuring the movement in the cost of living to any class has been generally followed and is sufficiently accurate for periods in which changes have been gradual and uncorrelated. It has been used with a marked absence of initiative by official statisticians in many countries during the war.[1] The process takes the simple form of weighting the changes of prices of commodities by their estimated relative importance in working-class consumption. The Labour Department of the Board of Trade (as it was in 1915) used the formula (in the present notation)—

$$100\left(E_1 \times \frac{p_1}{P_1} + E_2 \times \frac{p_2}{P_2} + \ldots\right) \div \left(E_1 + E_2 + \quad\right),$$

with the modification that round numbers were used for the weights. This is of course equal to $100 \times \frac{Q_1p_1 + Q_2p_2 +}{Q_1P_1 + Q_2P_2 +}$, where the denominator is the expenditure in 1914 and the numerator the expenditure necessary to obtain the same quantities of the same commodities at a later date. Labour leaders have quite accurately translated the resulting percentage as measuring that increase in wages which is necessary to maintain the pre-war standard in its complete integrity. Since, owing to the limitation of supplies it was, and is, obviously impossible to maintain the standard without modification, the measurement early in the war became almost purely academic, and as indicated above does not satisfy the conditions of validity for an index-number. It is unfortunate that rabbits were not included, for their disappearance from the market would long ago have forced a modification. As it is, the calculation continues to be given with the standing explanation, "For the "purpose of a continuous record of the movement of *prices* it must "be assumed that this relative importance has been the same "throughout the whole period during which these statistics have "been published" (*Labour Gazette*, February, 1919); further explanations follow, which (if rightly interpreted) show that the measurement has no practical importance. Enormous and very expensive mischief has been caused by this publication; the figure is commonly quoted by the Press as measuring the increase in the cost of living (not in the rise of prices, in spite of the italics in the *Labour Gazette*), and it is quite naturally used by Labour leaders as measuring the increase of wages necessary to meet the rise of prices. It appears not to be challenged by the Government, when adjudicating on wages, and actually formed part of the basis by which railway wages were to be fixed in September, 1918. No attention appears to have been paid to the findings of Lord Sumner's Committee, which so far as I can find has not been mentioned in the *Labour Gazette*. Yet the evidence of the Committee showed quite clearly that while the Ministry of Labour's index-number showed a rise of 108 per cent. in food prices from July, 1914, to June, 1918, actual expenditure had only increased 90 per cent., while the fall in standard of living was very small, and necessitated by war conditions. Every 4 points cost over a million pounds in the annual railway wage bill.

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[1] Alternative methods have been used in several neutral European countries.

METHOD III.—*Change of purchasing power when standards are different.*

When estimating the factor necessary for the correction of a change found in money wages to obtain the change in real wages statisticians have not been content to follow Method II only, but have worked the problem backwards as well as forwards. Thus they have ascertained the weighted average movement in prices on the basis of the standard in the earlier year $\left(\frac{S.\ Qp}{S.\ QP} \times 100\right)$, and have also estimated what the standard in the later year would have cost at the prices of the earlier year and compared the actual cost in the later year with the cost so found $\left(\frac{S.\ qp}{S.\ qP} \times 100\right)$. They have then taken the arithmetic, geometric or harmonic mean of the two numbers so found. A corresponding method for comparison of two places was used by the Board of Trade in comparing the cost of living in various countries in 1905–09; thus it was found that the English workman going to Germany in 1905 and maintaining his own standard would have increased his expenditure on food and fuel in the ratio 100 : 118, while the German emigrant maintaining his standard in England would have decreased his expenditure in the ratio 108 : 100 (Cd. 4032, pp. xliv, xlv).

This method appears to me valid for estimating relative purchasing power of money when the habits of living and the commodities purchased at the two dates or in the two countries are not dissimilar, but to break down as between, say, India and England, or as between 1914 and 1815, and possibly between 1914 and 1919. In comparing dissimilar standards it may be necessary simply to give accurate descriptions and not to attempt numerical measurements of change.

When this method is applied to the urban budgets above, it is found that the cost of the 17 articles for which prices are known increased 112 per cent. if we take as basis the quantities bought in 1914 (the *Labour Gazette* increase with slightly different rates also being 112 for large towns), while the increase is found to be 102 per cent. if we take as basis the quantities bought in 1918. The average of the two results, viz., 107 per cent., is not, however, a valid measure of the rise of prices for the reasons given above, that there are not enough independent entries to obtain precision, especially as the rates of increase vary from 100 : 142 to 100 : 400 and the quality of some of the articles (*e.g.*, tea) has changed. The corresponding figures for the agricultural budgets, where the change in amounts consumed is smaller, are 104 (1912 quantities), 102 (1918 quantities), and 100 (*Labour Gazette*, small towns and villages).

These figures can only be applied at the best to that part of wages which is spent on food and to those groups who are adequately represented by the budgets. The relative amounts spent on meat and bread, which vary greatly from class to class, affect the results obtained perceptibly.

METHOD IV.—*Change in expenditure irrespective of standard.*

Dr. O. H. Jenny (*Journal de Statistique et Révue Economique Suisse*, 1918) calls the result obtained by comparing actual expenditure in 1918 with actual expenditure in 1914 the "effective index-number" of the cost of living. This is measured in the notation here used by $100 \frac{\text{S. }pq}{\text{S. }PQ}$. More simply we may say that the average weekly expenditure on food in the urban budgets was 24*s.* 11*d.* in 1914 and 47*s.* 3*d.* in June, 1918, an increase of 90 per cent., while in the country the increase from 1912 was 84 per cent. If consumption had been limited solely by supplies or by voluntary restriction, and not by want of money, these percentages would show the increase in that part of income spent on food which was necessary to purchase the modified dietary instead of the pre-war dietary. If it had been the case that the whole of food supplies had been controlled and rationed according to needs and prices made uniform for all dealers, then maximum expenditure on food would have been fixed, and no plea for an increase of wages beyond that shown by the comparison of this maximum with the pre-war standards could have reasonably been maintained on the ground that it was necessary to meet the increased cost of food. In fact, many foods were not rationed, nor was their price fixed, and the rations were on a nearly flat basis so as to be insufficient without supplement for many classes of workers. Supplies of all foods were limited, and increase of wages led to competitive expenditure on unrationed food, checked now and again by fixing prices, but not removed in general by increasing supplies. Hence increase of wages helped to raise prices, and higher prices led to further demands for increase of wages. The *Labour Gazette* index-number of change of prices, assuming as it does purchases of unchanged quantities of milk, cheese, butter, sugar, tea and eggs, and the same relative importance of home beef, imported beef, home mutton and imported mutton, was sensitive to all these movements, and its frequent quotation as an officially established fact was—and still is—a potent factor in the increase of wages, and therefore of prices. In some periods, however, and notably during the increase in the supply of unrationed bacon in the first half of 1918, the *Labour Gazette* method showed a slower rate of increase than did expenditure, and in June, 1918, the percentage changes obtained by the various methods differed from each other less than in earlier months.

The measurement by realized consumption is only applicable to wages during the period that supplies are restricted, and also during the period in which the new doctrine that wages ought to be determined by cost of living is acted upon. As we pass into the normal condition in which supplies are sensitive to price, estimates of expenditure take their place in the measurement of the change of the standard of consumption, and no longer can be used for determining what wages should be.

Method V.—*Measurement of change of standard.*

In former times interest has generally been concentrated on the movement of real wages. The method has been to compare the money wages at two dates, and correct by the change of purchasing power measured by Method II or III; thus if wages at one date averaged 25*s.* and at another 30*s.*, while prices had increased 10 per cent., the movement of real wages would be taken as measured by (30*s.* ÷ 25*s.*) ÷ 1·10 = 1·09, *i.e.*, an increase of 9 per cent. But recent events have brought a different question into prominence relating to the degradation or improvement of the standard of food, clothing and housing actually attained; for in a period of restricted supply the measurement of real wages becomes itself unreal, since the money cannot be spent according to the wishes of its possessor.

Can the enforced change of standard be measured? A tentative answer can be given by yet another arrangement of the quantities

Q, P, q, p, viz.: $\frac{\text{S. qP}}{\text{S. QP}}$, which from its form shows that we are now comparing quantities weighted by prices, instead of, as before, prices weighted by quantities. In the numerator is evaluated the cost of the quantities actually bought at the later date reckoned at the prices of the earlier date. A person, who in 1914 had bought the dietary which was reached according to the urban budgets in 1918, would have paid 18*s.* 9½*d.* for it (excluding the foods for which prices cannot be stated); or more briefly the value of the 1918 dietary at pre-war prices was 18*s.* 9½*d.* (S. qP). A similar person buying the average 1914 dietary expended 20*s.* 6½*d.* (S. QP). Thus S. qP : S. QP = ·915. The 1918 dietary was worth 8·5 per cent. less at pre-war valuation than the 1914 dietary. The loss of satisfaction may perhaps be considered approximately the same as if the head of a family in 1914 had had to cut down his expenditure on food from 24*s.* 11*d.* to 22*s.* 10*d.* (including here an estimate for the unpriced foods). If the choice had been free, he would have cut down his purchases of the food that pleased or nourished him least and lost less than 8½ per cent. of his satisfaction; as it is, the enforced modifications were quite possibly of a kind which cut off more than 8½ per cent. These figures relate to the urban budgets; the corresponding fall from the agricultural data is 1*s.* 5½*d.* on 16*s.* 8*d.*, *i.e.*, 8·7 per cent.

To put the result more crudely, the urban workman spent 90 per cent. more on food and got 8½ per cent. less in return. In this measurement it is assumed that there is no change of quality—and, theoretically, that should be allowed for in estimating the prices—but actually I doubt if the bacon of the summer of 1918 would have been valued at 11½*d.* a lb. in 1914. I have purposely used the vague word satisfaction, because I do not imagine that there is any quite definite quantity that can be measured; many emotions, patriotic and others, were no doubt excited by the consumption of the war-bread and margarine of the summer of 1917, and I leave it to experts in hedonistic measurement to evaluate them.

On the same basis we can take a step further. If each of the quantities bought in 1918 had been increased 9 per cent., the purchases when valued at 1914 prices would have been worth 24*s.* 11*d.*, the actual expenditure in 1914, and there would have been little or no loss in satisfaction, though a modified diet. The 1918 expenditure thus raised would have been S. qp × (S. QP ÷ S. qP); the ratio of the increased expenditure in 1918 to the actual expenditure in 1914 is S. qp × (S. QP ÷ S. qP) : S. qP = S. qp : S. qP, that is the ratio of the prices weighted by the quantities of 1918. In other words if wages (so far as they are spent on food) were raised in the ratio obtained on the basis of the modified dietary they would have been sufficient to purchase goods whose pre-war value equalled that of the goods actually purchased before the war; but if they were raised in the ratio obtained on the basis of the pre-war dietary (*Labour Gazette* index-number) no such correspondence is found, and the money would be too much or too little for purchases of the modified supplies. Thus the existing standard of expenditure affords a sounder method of weighting than does the pre-war standard.

March and April, 1919, *compared with July*, 1914.—By the courtesy of the Ministry of Food I am able to use estimates of consumption for March, 1919, which may be regarded as properly applicable to the retail prices of March 1 and April 1. The articles included are meat, bacon, tea, sugar, butter, margarine, cheese and eggs, while it may be assumed that the consumption of bread and flour has not changed significantly since last summer. These articles account for two-thirds of the pre-war expenditure on food, the only serious omission being milk. The consumption is estimated by dividing the whole used weekly by the civilian population by the estimated number of that population in March, and multiplying the quotients by the appropriate number of persons in the typical family to make them comparable with the working-class budgets of 1904, revised to 1914. It was shown in the report of Lord Sumner's Committee that by this method index-numbers would be obtained with very fair accuracy, and in this paragraph the resulting quantities are only used to obtain a system of weights. The prices changes used are those shown in the *Labour Gazette* for large towns. The results may be exhibited in tabular form:—

Weekly Expenditure on Principal Articles of Food by Family consisting of 4·37 "*men.*"

Quantities as in	Valued at prices of			
	July, 1914.	June 1, 1918.	March 3, 1919.	April 1, 1919.
	d.	*d.*	*d.*	*d.*
July, 1914	198	431	443	429
June, 1918	168	369	—	—
March, 1919	163	—	341	331

Quantities as in	Percentage increases from July, 1914, to		
	June, 1918.	March, 1919.	April, 1919.
July, 1914	118	124	117
June, 1918	108	—	—
March, 1919	—	110	103

The method advocated in the previous paragraph shows a markedly smaller increase than the numbers (shown in the first line) based on pre-war weights. The difference for June, 1918, is very nearly the same as that shown already when more articles are included.

Another method that has come into considerable prominence, and which at first sight seems more definite, is to measure by calories. But man cannot live by calories alone, even if the elusive vitamines are added and enough protein is present. The food must also suit his digestion and stimulate his appetite. According to Professor T. B. Wood's[1] table the cheapest form of calories in 1915 at Cambridge was pea-nuts, of which 10½ lbs., costing then 2*s.* 7*d.*, provide sufficient calories with a surplus of protein to supply a moderate worker for a week. The pre-war agricultural budget yields only 4½ per cent. less calories[2] than the urban workers', which cost 48 per cent. more. No workman, nor any other rational person, would consider an enforced diet of bread, margarine and cheese as satisfactory as that which he could buy with a full purse in an open market; and I have seen signs that calorie measurement is suspected and distrusted.

Apart from their physiological importance, and independent of the doubt as to the adequacy of the scientific basis, calories serve an important purpose in statistics, since they afford a means of adding and comparing dissimilar foods without reference to their prices, and a considerable uncertainty as to their exact relationship to nourishment has little effect when the diets compared are not very dissimilar. When we compare the diets shown in the table, which all provide a reasonable variety of food, we are on fairly safe ground.

The calorie value of the 1918 dietary was about 3 per cent. below the pre-war dietary in the case both of the urban and of the agricultural budgets. If we may replace the word calorie by nutrition, we have that the decrease in nutrition after four years was 3 per cent.

We can now amplify our earlier statement as follows: the urban workman spent 90 per cent. more on food in 1918 than in 1914, and in return got 8½ per cent. less in satisfaction or 3 per cent. less in nutrition. If he had increased all his purchases in 1918 in proportion so as to restore the nutrition, the statement would have become, he spent 96 per cent. more on food, obtained the same nutrition, but 5½ per cent. less satisfaction, a loss valued in 1914 at 1*s.* 5*d.* per family per week. Though there is a good deal that is fanciful in this method, I think it is worth consideration.

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[1] *Food Economy in War Time*, p. 15.

[2] The average family expressed in "equivalent men" is smaller in the agricultural budgets, and per "man" the calories are very nearly the same.

If the pre-war standard is taken as a starting point when increased wages are demanded, it is not necessary, nor at present reasonable, to ask that it should be restored item by item exactly; the relative amounts of home and foreign meat (which have considerable influence on the index-number), and the quantities of sugar and dairy produce, will not for some time be available as before the war. It is rather necessary to devise a diet, based on available supplies, as nutritious, digestible and not less attractive than the pre-war diet, and estimate at what price it could now be obtained. It may happen that the result would be practically the same as that shown by the Labour Department's index, but there is nothing in the formation of that index-number to lead us to depend on such agreement.

I do not propose to discuss expenditure on necessaries other than food, for there is no difference in method, though there is considerable difference in the accuracy of the data; and as regards data I have nothing to add to the material in the report to which reference has been made.

It should be said, however, that certain classes of expenditure (of which rent, insurance and workmen's travelling are instances) had not increased or increased much less than food, while there is no good evidence that on the whole the cost of clothing had increased more rapidly than that of food. So that the increase in the cost of the standard was less in the summer of 1918, when all necessary expenditure is included, than is indicated by the figures based on food alone. So far as the high price of clothes is due to want of supplies, the same analysis applies as in the case of food; it is worse than futile to raise wages for the purpose of purchasing goods which do not exist. I do not feel that I have sufficient material to obtain an accurate measurement up to the present date, and I am unwilling to express an unsupported opinion.

Household budgets of expenditure.

We can proceed a very long way towards measuring change of prices and some way towards observing changes of standard, if we know the movement of prices and the total consumption of different kinds of food in a country and the change of its population; for we can assign the weights in the various formulæ used above on the basis of average consumption, and if we have records of retail prices such details as those shown on pp. 344–5 can be given for the average "equivalent man" in the country as a whole, and each of the Methods I to V followed out. This course is restricted, however, to those foods for which there is information as to quantities, and, at any rate till the Ministry of Food had established its statistics, only rough results could be obtained for this country. When, however, we want to differentiate one class from another, it is necessary to know the relative quantities consumed by them, and whenever we pass to absolute instead of relative measurements we need to know, with more accuracy than the general consumption statistics can give, the actual quantities consumed by households. For dealing with expenditure on objects other than food, general statistics are not available. Hence the necessity of obtaining budgets.

I pass by some important questions. How far are the households from which budgets can be obtained selected from the class to which they belong by virtue of the possession of intelligence and the exercise of thrift? Can we ensure that we obtain records, not biassed estimates? How should expenditure on tobacco, alcohol and other things which many persons do not consume be treated? These have often been discussed, and I have nothing new to add; but it should be emphasized, as governing the sequel, that the group we sample is not the working-class as a whole, but the class of which the budget-keepers are representative.

Given the class from which selection is made, we have to consider the accuracy of the average obtained by sampling, the variation shown, and the relation of the variation shown to the age and sex constitution of the family. Much attention has been paid to the resulting averages, but relatively little work has been done on these three aspects of the problem.

If we assume that the budgets are good evidence of the expenditure of a definable class, the difference between the averages obtained and the averages that would result if information were obtained from every household in the class may be expected to be small or great, according as the number in the sample is great or small, and according as the variation of expenditure within the group is small or great. In the more exact language of mathematics the standard deviation of an average obtained by sampling is $\sigma/\sqrt{n}$, where n is the number of samples and σ the standard deviation of the particular quantities or sums in question in the whole group; a similar rule holds approximately with regard to "probable error" or "quartile deviation" as it is better called.[1] Thus in 99 budgets from the Midland counties summarized in Cd. 2377 of 1904, one quarter of the families spent 4*d*. or less on eggs per week, one quarter 12*d*. or more; the quartile deviation is 4*d*. and the probable error of the average of 99 is approximately $4/\sqrt{99}$ pence, so that the resulting average (given as 10¼*d*.) is as likely as not to be as much as ·4*d*. in error as the result of the smallness of the sample.

By the courtesy of the Ministry of Labour I have been able to examine part of the originals of the well-known 1904 collection of budgets. I have worked roughly with the quartiles and probable error and the following are some of the results.

Midland and Miscellaneous Counties, 1904. *Quantities bought by Households*, 410 *Budgets*.

	In group.				Probable error of average.
	Quartile.	Median.	Quartile.	Average.	
Bread .... lbs.	16	24	32	24·1	·4 lbs.
Flour .... ,,	3	3½	7	5·7	·1 ,,
Meat .... ,,	4	5	7	5·7	·07 ,,
Bacon .... ,,	1	1½	2	1·7	·025 ,,

The great variation within the group is noticeable; and it requires considerable faith in the applicability of the theory of probability to believe that the precision of the average is so fine as the table indicates.

Corresponding figures for 403 budgets from Scotland give averages and probable errors: Bread and flour 31·1 ± ·5 lbs., meat 4·96 ± ·07 lbs.

In these cases the quartile deviation in the group is about 30 per cent. of the average in the group. If we take 100 independent samples the standard deviation of their average is, therefore, about 4 per cent. We should have to take 1,600 samples to get as small a standard deviation as 1 per cent. It is very regrettable that neither the individual budgets nor any measure of their variation have generally been published, except in collections on so small a scale that the precision they have must depend on the skill by which typical families have been selected rather than on the elimination of variation resulting from large numbers.

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[1] The "quartile deviation" of a group is half the distance between its quartiles.

The variation in consumption depends partly on income and partly on size of family, and partly on local custom. It is no doubt reduced when budgets are classified separately according to district, grade of income and constitution of family. In the report on the 1904 budgets the classification by income is nearly valueless because families of all sizes were merged.[1] This was probably unavoidable, because only a collection on an enormous scale would bear such minute division.

We can eliminate to a considerable extent that part of the variation which is due to size of family either by the method of partial correlation or by reducing all budgets to a standardized family. For the latter purpose one of the estimates of the needs, reckoned in calories, of persons of different ages and either sex must be taken. In the Report on the Cost of Living (Cd. 8980) the equivalents used were: Male over 14 years 1, female over 14 years and children 10 to 14 years ·83, child 6 to 10 years ·70, child under 6 ·50. The average of the budget families was then 4·57 units, and this was taken as the "standard" family. The expenditure of the sub-classes considered and of the budget families of 1904 were then raised or lowered in the inverse ratio that the number of units their average contained bore to 4·57.

A better method for the instructed reader, which has been used in Glasgow and Birmingham,[2] and in part of the report just referred to, is to give all the quantities and sums per unit or "equivalent man."

There are two weak points in either procedure. Housewives, in fact, probably do not feed the members of their household with calories in the proportions the scientists consider expedient; for appetite, custom, the available food, and the special needs of individuals may work out quite differently, and so while we may gain in apparent definiteness we may lose touch with actuality. Also, the proportions are calculated in calories but applied to shillings. A man may need only twice as much nourishment as a child of 5, but if he takes it in meat and bacon and bread, and the child eats bread, dripping and sugar, at pre-war prices his food costs much more than twice the child's food; and if a quite young child is fed principally on milk he costs more than his elder brother on the diet just named. Where the family can only afford meat for the man, while the rest are nearly vegetarian, the system of units may be quite wrong. These considerations tend to vitiate comparisons between the expenditure of a family where there are children over 14 and at work, such as is the standard in the 1918 budgets, and that of a family where there are three or four young children, which is the type generally aimed at by enquirers and assumed for the settling of the amount desired in a minimum wage. This difficulty, however, needs only a little investigation for its removal.

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[1] Analysis of some of the budgets shows that the apparent changes in consumption in passing from the lower to the upper grades of income are mainly due to the presence of grown sons earning more and eating more, where the income is above the average.

[2] *An Investigation into the Dietary of the Labouring Classes of Birmingham,* 1913–14, by Dr. Carver; Council House, Birmingham.

Report upon a Study of the Diet of the Labouring Classes in the City of Glasgow, 1911–12, by D. Lindsay and Dr. Paton; Physiological Department, University of Glasgow.

I have evaluated the expenditure on food per "equivalent man" for each of the 971 working-class budgets used by the Cost of Living Committee, and found the standard deviations in 13 sub-groups. The standard deviations of the resulting *averages* are given on p. 15 of the report; they are about 3*d.* on 10*s.* in the larger groups. The standard deviations of the groups themselves, before averaging, are of course much larger, in fact, equal those of the averages multiplied by the square roots of the numbers of entries, and are as follows:—

Standard deviations in various classes, expressed as percentages of the averages of the classes.

Classes.	Skilled.	Semi-skilled.	Unskilled.	Together.
Districts—				
Scotland	26	?	36	29
North of England	30	36	30	33
Midlands	34	21	27	31
London	21	?	26	24
E. and S.E.	30	?	?	33
South-west	29	?	?	28
Wales	30	?	?	30
Great Britain	31	29	31	32

The figures range about 30 per cent., and little change is made when we merge the three classes in a district or all the districts in a class. The "quartile deviation" is about 22 per cent., which is sensibly less than those found above (p. 356) for details of consumption of separate foods. The standard deviation for the unstandardized families in the 1918 budgets has not been computed, but the quartiles and average are 36*s.* 3*d.*, 54*s.* 9*d.* and 47*s.* 3*d.*, the quartile deviation therefore is 9*s.* 3*d.*, *i.e.*, about 20 per cent., nearly the same as when the families are standardized.

The deviation thus found when the groups are drawn from fairly homogeneous districts, and when the correction has been made for the size of family, is very remarkable, especially since many purchases are rationed. I doubt if this phenomenon has been systematically observed hitherto, and it appears to me very important. It appears to depend on variability of income rather than on any other factor. It also tends to confirm the suggestion that standardization is imperfect.

The records of expenditure on food per "unit" when all the classes are merged together form a continuous group, graduating regularly from a definite "mode." This group has been compared with Professor Edgeworth's second approximation to the Generalized Law of Great Numbers and with Professor Pearson's Type III.[1]

Weekly expenditure on food per "unit" in 970 urban families, 1918.

Expenditure.	Number of cases.	Law of great numbers.	Type III.*
		†	†
Not exceeding 5·5*s.*	18	22 ± 5	7 ± 3
5·5*s.*—	107	123 ± 10	122 ± 10
7·5*s.*—	255	233 ± 13	252 ± 14
9·5*s.*—	245	248 ± 14	250 ± 14
11·5*s.*—	173	168 ± 12	172 ± 12
13·5*s.*—	101	89 ± 9	95 ± 9
15·5*s.*—	38	51 ± 7	45 ± 7
17·5*s.*—	17	22 ± 5	19 ± 4
19·5*s.*—	9	11 ± 3	7 ± 3
Over 21·5*s.*	7	1	1

* Ordinates at the centres of the grades.
† Standard deviations.

The quantities involved are as follows: average, 10·75*s.*; st. dev. 3·156*s.*; $j = \cdot 297$; $\beta_1 = \cdot 708$; $\beta_2 = 4\cdot 035$; $\kappa = -11\cdot 575$. Type I was tried but proved unworkable.

The fit is remarkably good, by any test, except for the seven families of hearty eaters who confessed to over 21*s.* 6*d.* per "man," and in the case of Type III for the 18 families who starved on less than 5*s.* 6*d.*

To some statisticians the regularity of the observations thus shown will be evidence that we have observed accurately a real phenomenon, though, of course, the phenomenon is not in any way explained by the curves.

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[1] For the working out of these figures and for the correlation which follows I am indebted to Miss King and Miss Mackenzie at the School of Economics.

The method of partial correlation has been applied to the family expenditure on food of the 390 families of the skilled classes where there were one or more persons over 14 years and two or more children under 14.

The notation and quantities involved are as follows:—

	Expenditure on food.	Number over 14 years.	Number under 14 years.
Average	51*s.*	2·48	3·56
Difference from average	$u \times 5s.$	x	y
Standard deviation	$\sigma_u = 3{\cdot}03 \times 5s.$	$\sigma_x = {\cdot}836$	$\sigma_y = 1{\cdot}40$

$r_{xy} = -{\cdot}0525,\ r_{ux} = {\cdot}504,\ r_{uy} = {\cdot}315.$

The equation obtained is $u/\sigma_u = {\cdot}52x/\sigma_x + {\cdot}35y/\sigma_y$, which leads to the formula—

Expenditure (shillings) = 14·5 + 9·4 × number over 14 years
+ 3·7 × number of children,

and to the following table:—

Family expenditure on food. (Shillings.)

Number of persons over 14 years.	By formula.				Average of actual cases.			
	Number of children.				Number of children.			
	2	3	4	5	2	3	4	5
2	40·7	44·4	48·1	51·8	40·5 (74)	45·2 (74)	47·1 (53)	52·9 (25)
3	50·1	53·8	57·5	61·2	54·8 (21)	51·2 (17)	58·2 (16)	64·9 (17)
4	59·5	63·2	66·9	70·6	58·0 (10)	60·2 (10)	78·1 (6)	— (0)

The numbers in brackets are the numbers of actual cases averaged.

The agreement between experience and formula is as close as can be expected, when the considerable standard deviation and the small numbers of cases are considered.

We thus reach the conclusion that in the skilled classes each additional person over 14 years involved the expenditure on food of 9*s.* 5*d.*, and each additional child 3*s.* 8*d.* The expenditure per head and per "equivalent man" diminishes as the number in the family increases, whether by the presence of more adults or of more children; but the diminution is slow for additional adults, who earn money to pay for their food, and comparatively rapid for additional children, who have to share in the expenditure of their father's earnings; thus per "man" the expenditure for a family consisting of man and wife and two children under 14 is 12*s.* 10*d.*, for man, wife, son and daughter both earning, and two children is 11*s.* 10*d.*, and for man, wife and four children under 14 is 10*s.* 7*d.* As usual young children in the larger families are found to have the worst chance of adequate nourishment.

With less than 1,000 budgets it is hardly safe to aim at greater sub-division or to try to state any generalized laws of expenditure. It is evident that our knowledge of expenditure is very imperfect; it is perhaps sufficient to allow the formation of valid index-numbers of the movement of retail food prices, but is insufficient for any purposes for which we require more detail than the averages show.

I am very conscious that this paper, dealing as it does with niceties of method, may seem inappropriate at a time when so many decisions depend on the broad results of the movement of prices; it is but a poor contribution to the solution of practical questions to indicate that the data are insufficient and the methods open to question. This society, however, is perhaps better fitted at its meetings to discuss principles or general tendencies, rather than to receive material for current action. The problems of price measurement will continue to press, and in America and possibly elsewhere data as to expenditure are being collected on a large scale with a view to future wage-decisions. If, as seems probable, it continues to be held in this country that the cost of living is relevant to the determination of wages, then much more care ought to be taken as to method and much better material ought to be collected, than has hitherto been the practice.

DISCUSSION ON DR. BOWLEY'S PAPER.

PROFESSOR GONNER said it gave him very great pleasure, in beginning his remarks, to move a vote of thanks to Dr. Bowley for the very careful Paper he had put before them, and for the great trouble involved. From some points of view he had had to look at the matter rather as a practical question than a matter of theory. From a practical point of view he wished to emphasize very strongly what Dr. Bowley had said as to the necessity for more care being taken in the calculation of a price system on which wage systems were undoubtedly going to depend very largely in the future. He did not think that there was much question that the relation between wages and the cost of living or the variation of prices had become a practical feature at the present time. In a vague sort of way, of course, it had been a feature for a long period, because even if they took the movement of prices just prior to the Napoleonic wars and the lack of movement in wages, the necessity of some relation was pointed out by several acute observers. He ought to add that no administrative action was based upon their contentions. At the present time they stood in this position, that administrative action had been taken, and it had been based upon material which was insufficient. He thought it was fortunate that it was not more insufficient than had proved to be the case. Dr. Bowley had suggested that a great many people were to blame for that, especially, he thought, officials. Personally he did not think the officials were to blame. He thought if anyone was to blame it was the executive Government of the country. He wished to correct one point Dr. Bowley had made. As far as he knew, wage decisions given by Arbitration Tribunals had not been plainly determined by the figures to which he had alluded. They had been based on those figures, but with certain modifications, and he could say that was the case at the present time from his own practical experience. At the same time these figures formed the basis used, and these had been taken for the simple reason that there were no others. There had been no means of determining what alterations should be allowed for in wages other than the Board of Trade or Ministry of Labour figures showing the change of certain retail prices. It was quite true, as Dr. Bowley had said, that there was apparent neglect of the Sumner Budget Report. Dr. Bowley knew him well enough to know that at any rate it was not neglected by the Ministry of Food, to which he was formerly attached. But the real difficulty was that the other method of determining changes had been already adopted and was in progress, and he thought it would have been extremely difficult, in fact impracticable, to substitute a new method without leading to a suspicion, a quite unworthy one, that figures had been juggled with so as to show a smaller result. Speaking as an individual, he was perfectly certain that had it been suggested that the rise was only 90 in July instead of what was shown by the reported figures of the Ministry of Labour, there would have been an instant feeling that that new figure was being adopted because it was rather more convenient to the public purse. At that particular time and with the conditions which were then ruling, he thought it would have been very unwise indeed to have allowed anybody on tribunals or upon committees to be open to such a suggestion. The second reason why he thought the Sumner Budget did not obtain more notice in the press of the country was because it was drawn up in a complicated manner. He was very sorry that the Report was published in the undiluted form at the present time because it needed a considerably deal more attention than the somewhat occupied minds of people at that time could apply to it. As far as he could, he wished to clear certain bodies from not having made use of the Report, but he wished to say, perhaps for the satisfaction of Dr. Bowley and others, that certain Reports were always drawn on the basis of the Sumner Committee Budget at the present time. They were drawn on both bases, and the Sumner Committee basis was adopted as the ruling one. He wished to put one question which always puzzled him in taking that particular Budget method. He did not refer to the Budget of 1918; he knew how it was got; and both Dr. Bowley and the Secretary of the Committee had shown him repeatedly. But what puzzled him a little was a comparison of the Budget of 1914, speaking from a statistical point of view, because there was no real Budget of 1914, and the Budget of 1914 had to be created or re-created from earlier Budgets. That seemed to him to be rather a serious defect from a statistical point of view. They were not dealing with two real Budgets. They were dealing with one real Budget, and another Budget made from earlier material. He thought the Sumner Budget represented to a larger extent what he should call the highly skilled class rather than the earlier Budget did. It seemed to be a Budget drawn on the expenditure rather, biassed in the direction of what he would call highly skilled labour. If it were not drawn on the highly skilled labour, he was bound to say that even allowing for the increases in wage which had been rather freely given, the less skilled class of labour would hardly have been able to live at all. He thought it well to explain the particular circumstances which had led to a continuance in the use of figures which were admittedly imperfect. What he hoped was that now that matters were settling down some better method would be determined for measuring actual changes. He thought Dr. Bowley had assisted them to see the defects of the respective methods, and he knew he realised as fully as anyone else that some method would have to be adopted, and that what they would have to try and do was to choose the method which was the least defective. Dr. Bowley thought, and perhaps rightly, that the method used was defective. The reason for its use was that it was the only actually published method for the first three years of the war. He was particularly interested in one part of Dr. Bowley's Paper, namely, the suggestions he made as to the determination of changes in what they might call satisfaction between Budget expenditures at different times. He was only sorry that Dr. Bowley was not able to devote a little more of his time to that particular theme. It appeared to be an extremely important matter. He believed that there would be adopted some system of Budget calculation, but if such a system were adopted, it would be necessary to have some check on the bare calculation of expenditure at two different periods, as such a comparison should show the fall or increase in the quantity of satisfaction. He remembered once when Dr. Bowley and he were working together, Dr. Bowley foreshadowed the time when they would have all the foodstuffs worked into one big sausage, and they would cut off so much of the sausage. If they had a pound of sausage there would have been no difficulty in obtaining the variations between one Budget and another of expenditure, because it would have been merely quantitative. They would have had less sausage at one period and so much more at another. But, unfortunately, from the point of view of abstract reasoning, that time seems likely to vanish even further away than it was in the days when the suggestion was made. But when they passed from that particular point they came to two other points which seemed to him important. He thought it would be quite essential that when Budgets were taken an occasional Budget should be taken in the winter. One defect was that they ran rather to summer or spring budgets than to winter budgets. There were, of course, certain things of which the seasonal consumption varied greatly. If, for instance, they took the expenditure on eggs, he gathered from the summer budget that a skilled working class family had nine eggs per week habitually. But fresh eggs at one period were practically unobtainable; and if they took the price curve with eggs in and with eggs out, there was a remarkable difference. It had been singularly marked during the last six months, but had become a little less marked at the present time. Again, he thought in all budget calculations they ought to distinguish —and it had been done in certain calculations— between an increase in cost which had occurred owing to taxation. Taxation was put on presumably under the impression that the people who were taxed would pay their tax. If their wages were increased to meet that, the tax was put on to them in order that somebody else should pay. Those two things seemed to concern the practical use of the standard which might be followed in the future. In the first place, they would have to follow out the suggestions made by Dr. Bowley as to some method of checking differences in quantity as it were, and in the second place they would have to take some critical method of determining the way in which budgets should be taken and used. One minor point to which Dr. Bowley had alluded was the question of the difference between children under 14 and children over 14. He did not know how far it was true, but he had seen a great many figures on the subject which pointed out that really the critical eating age was from about 14 to 18, and that after 18, unless the survivor was engaged in rather severe manual work, there tended to be a stability and certainly not an increase in the amount of nutriment demanded. He himself often thought that they should be very thankful that the trouble due to the rise in prices had not been greater than had been the case. As a rule rises in price had created an amount of disorder and difficulty in the country far beyond that experienced at present. Taking the three great periods: the period in the sixteenth century, the period round about the times of the Napoleonic wars, and the present period, he thought the social disturbances occasioned by the two earlier periods of rise were immeasurably greater than any social disturbance which had been occasioned now, and he felt that the people and the Government of the country had to congratulate themselves that sane methods were adopted of facing the problem of the relation between wages and prices. It had been expensive, and he agreed with Dr. Bowley that in many cases advances had been given on a scale not clearly justified, but he could not but think the general policy had warded off what might have been a very grave social disaster to the country.

It was open to people to argue that the best way of meeting the argument altogether would have been frankly to meet any rise in prices, and he remembered discussing the matter several times with Lord Rhondda as to whether the best way would not have been boldly to have faced the question of prices, subsidise prices if necessary and keep them actually down. The matter was one of great interest and great importance; it had been of very great importance in the past, and he believed it was going to be of very great importance in the future.

Professor EDGEWORTH said it gave him very great pleasure to second the vote of thanks. He thought Dr. Bowley had thrown light on three or four important problems. First, as to the index number representing the change in prices, Dr. Bowley had indicated the difference between the two species of that operation. There was first of all the one to which wholesale prices, perhaps without weighting, were appropriate, and there was another with contrary attributes. In the first the particular prices might be regarded as somewhat subordinate. They were, so to speak, shadows of the real thing which they measured. In that respect, they were like the observations which an astronomer or a surveyor combines in order to ascertain the real place of a star, or the true value of an angle. Or to use a closer, though less familiar physical analogy, the data were like observations made on several barometers. Such observations might be put together in order to obtain the best possible determination of what might be called a real thing, the pressure of the atmosphere. That pressure was diffused throughout a region very much as a change of prices was diffused over trade and industry. That was the kind of conception which Mill entertained when he supposed the quantity of money in every one's possession to be suddenly doubled, and deduced the consequences of that supposition. With more probability it might be supposed that in compliance with the advice of Jevons the Americans had altered their monetary standard and adopted new dollars, of which 103½ were about equivalent to 100 of the old dollars. In such a case there would be an almost universal change in prices, including the hire of labour. Almost every one would take his bill and write quickly 103½ for 100. There would, no doubt, be some dispersion in the price-variations. Still, there would be a good average; one based on a great number of items, and not at the mercy of one or a few constituents according as they might be omitted or more or less heavily weighted. An index number of this kind contrasted with one which had rather the character of a commercial account, formed from the value of a definite set of articles. For instance, some practical purpose might be subserved by recording changes in the value of a soldier's kit, or of the equipment required for consuls in foreign countries—with respect to which there were some interesting American statistics. The things prescribed might be identical, but the prices would be different at different times and places. The measure of these changes might be called an index number; but it should be observed that it had not necessarily the character of Probabilities, *sporadic dispersion*. One item, say rent, might rise enormously, while other prices fell *en bloc*. But the arithmetical operation by which the value of a given set of articles here and now compared with the value of the same articles at some other place or time was not stultified by the circumstance that the prices, like the stars of which Dr. Bowley had spoken, "move off jazzing in con- "stellations." Yet Dr. Bowley was justified in using illustrations and terms which savoured of the theory of errors; even with reference to the latter kind of index number. For in the first place the prices with which they had to deal might not be accurately ascertained. It was well to have a procedure which, so to speak, covered a multitude of inaccuracies. More important was the circumstance that commonly they were not merely measuring change in the value of certain objective things, but rather in that of a subjective quantity. The curtain was not the picture in this case. There was something behind it, namely, what Dr. Bowley had alluded to as "satisfaction." He (Professor Edgeworth) hesitated to speak with a German author of a *Genusseinheit*, a unit of satisfaction. Still some quantitative conception must be adopted. It was, however, so indistinct and indefinite that the calculation would be hopeless were not the inaccuracy covered, so to speak, by the theory of probabilities. When they had a good number of items varying, though each might very imperfectly represent what they sought—the measure of satisfaction—still by a compensation of errors there would be obtained a tolerably stable and trustworthy result. The attempt to dispense with the aid of Probabilities was the great fault of many writers on this subject, in particular, of Mr. C. M. Walsh, the learned and acute author of a stout volume on *Exchange Value*, a great part of which was devoted to the investigation of a formula proper to the case, in which there were only two prices! The principle might be illustrated by the doctrine of Taxation. The canon that equal, or equitable, sacrifice should be imposed on the taxpayers involves a conception as indefinite as the quantity of satisfaction obtained by consumers of commodities. Yet the subjective quantity is amenable to the rules proper to objective measurements. A better approximation to the *quesitum* is secured by having several heads of taxation, thereby avoiding the danger of an enormous uncompensated excess of burden to which the Single Tax is liable. "Impôt unique impôt inique." Another important problem handled by Dr. Bowley was the measurement of the growth in the consumption of commodities by the people. That was a problem about which he thought that the members of the Statistical Society might speak with some pride, as its treatment had taken its origin in the bosom of their Society. An analogous problem, to measure the growth in the quantity or volume (as distinguished from the value) of foreign trade had been discussed in several Papers read before the Society. The priority in this kind of calculation belonged, he believed, to Mr. Stephen Bourne.[1] Sir Robert Giffen followed, proving in our Journal[2] and elsewhere[3] that contrary to appearances the quantity of trade was not declining. More recently Mr. George Wood[4] had read a Paper in which there was constructed an index-number showing the growth in the consumption of commodities by the working classes. It would be remembered that he took the percentage changes in the amounts of tea, meat, wool, and so on, that were consumed at different periods, and averaged these ratios. He tested the validity of the result by employing several different systems of *weights*, thereby showing that he had indeed arrived (to use his own words) "at a definite consistent and reliable "index-number." In all such cases the thing measured was not simply objective. There was an element of the subjective quantity, "satisfaction," as Dr. Bowley had intimated. The two problems which had been mentioned led up to a third, the adjustment of wages to changes in the value of money For this purpose it was requisite to determine from time to time what money payment in the present would afford to the workers the same amount of comforts and luxuries, the same degree of material welfare as they enjoyed at some previous epoch, say the year before the war. He agreed with Dr. Bowley that with this view it would be desirable to devise a diet, based on supplies now available, as nutritious and attractive as the pre-war diet. That might be the best course under the present circumstances, but he was not certain that the second best course was to use the items of present expenditure, and those only, as Dr. Bowley had suggested, for the construction of the index-number by which the change in the value of nominal wages was to be measured. In general it was preferable in the construction of the "weights" to utilise the expenditure at the prior epoch (*e.g.*, 1914) as well as the expenditure at the time of reckoning. He admitted, however, that general rules were not available when supply and demand had been so largely interfered with by rationing and control of prices. Another head under which Dr. Bowley's paper deserved praise was his treatment of family budgets. Dr. Bowley had properly dwelt not only on the average, but on the deviations from the average expenditure. For if that deviation is considerable, a regulation based upon the budget of the average family would probably be unsuitable to many households. As to the deviation, the "probable error," of the average itself, he agreed with Dr. Bowley in thinking that it required considerable faith in the applicability of theory to believe that the precision of the average was so great as appeared. The explanation of the deceptive appearance was no doubt the fact that the 410 budgets which were averaged could not be treated as *independent* constituents; as often in concrete statistics, caution was required in applying the rules based on the assumption that the data were as independent of each other as, say, the results of tossing a die so many times. Referring to Dr. Bowley's adaptation of expenditure to a mathematical formula, he (Professor Edgeworth) agreed that the regularity thus exhibited was evidence of what might be called a "real pheno-"menon," one corresponding to the more objective kind of index-number.

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[1] See *Journal of the Royal Statistical Society*, vol. lii (1889), p. 403, as to the early date of Mr. Bourne's calculation.

[2] *Journal of the Royal Statistical Society*, vol. lxii (1879), p. 55.

[3] In his classical Reports to the Board of Trade.

[4] See *Journal of the Royal Statistical Society*, vol. xlii (1899), p. 654, and ontext.

Sir Leo Chiozza Money said he wished to associate himself very heartily with what had been said by Professor Gonner and Professor Edgeworth as to the interest and value of Dr. Bowley's Paper. Members of that Society expected interest and value from Dr. Bowley's Papers, and were never disappointed. Dr. Bowley criticised the use of the *Labour Gazette* prices index-number as a test of the cost of living and consequently of the propriety of basing upon those index-numbers any changes in wage given in compensation for the rise in the cost of living. Dr. Bowley made an observation in his Paper which he was afraid would pass beyond those walls. He referred to a passage in which, after giving the facts with regard to the *Labour Gazette* figures, Dr. Bowley said "Enormous and very "expensive mischief has been caused by this publication; the "figure is commonly quoted by the Press as measuring the increase "in the cost of living (not in the rise of prices, in spite of the italics "in the *Labour Gazette*), and it is quite naturally used by Labour "Leaders as measuring the increase of wages necessary to meet the "rise of prices and so on." Then followed a criticism of the Government because they gave or consented to a rise in wages based upon that method which was stated to be fallacious, concluding with the words "Every four points cost over a million pounds in the railway "wage bill." He ventured on that to make a very serious appeal to Dr. Bowley and also to the members of the Society, because they lived in very serious times when things of that kind were liable to be misunderstood. He wished to direct the attention of the members of the Society to the methods of the Sumner Report and to their applications to conditions which might have obtained. In April, 1917, they were threatened with disaster. Ships were being sunk at such a rate that if it had gone on a few months longer they would have been very short of food. They would have been brought so near to starvation that within nine or ten months they would have had to surrender. The Government would have had to take very severe rationing measures, not only with the working classes, but with all classes; they would have had to go very short. They would not have been able to buy food whether they had the money or not. The Sumner Committee would have been able to report that a working class family was not buying food, and that therefore its cost of living had not gone up or had even fallen. That although the prices would have gone up considerably, the Government, accepting the method he, the speaker, criticised, would have said, "Right. Your cost of living has gone down. We propose to give "you smaller wages." Later still, when we had very little left, the Government, accepting the Sumner verdict, could have said, "Prices "have gone up further, but as prices are so high, you do not want "so much; it is quite clear that your wages can be again reduced." The final point would have been reached and the final humour—and he was always delighted with the way in which humour peeped out in Dr. Bowley's Papers—when, as the last British citizen expired from lack of food, he might have been consoled with the thought that as there was no food to buy he needed no wages. His cost of living had fallen to zero! That plain application of the theory to the facts of a case which they only escaped from very narrowly indeed seemed to him to constitute a very serious criticism of the methods of the Sumner Report. It was a criticism made by every Labour Leader who handled the Sumner Report. After all, the Labour Leaders were very shrewd men. He would like to hear them argue the case in that room. He would like to hear Mr. J. H. Thomas or Robert Smillie on it. He promised them that they would say some things which would take a great deal of answering. Carrying the matter into terms of practical life, which Dr. Bowley was not averse from considering, he spoke of "satisfactions." He wished to remind them of the "satisfactions" which the miner needed. The miner was accustomed in normal times to take down to his place of very arduous work some cheese. But the time came when there was no cheese. "Right," said the method of the Sumner Report, "then you do not want any money to buy it."

Dr. Bowley asked where the Sumner report stated anything of the sort.

Sir Leo Chiozza Money said that was the inference; he did not wish to misrepresent anything; he was speaking of the effect of the method. What he meant was that the Sumner Report, in effect, measured the cost of living by what the man bought. He understood the Sumner Report measured the variation in the cost of living by the actual expenditure of working class families. As cheese disappeared from the purchase list, it disappeared from the examined budget. Therefore under the Sumner theory the cost of buying that cheese would not appear, although cheese had greatly risen in price. Therefore, according to that theory of adjusting wages, the miner would not have been granted by the Government or his employer such an amount of money as would be necessary to pay the increased cost of cheese, because no cheese was needed. It would deny, therefore, the miner's family an extra sum which might, expended on some other thing, such as a tin of salmon, make up to that man when he came up from the shaft that satisfaction and that nourishment which he missed by going without the cheese. It seemed to him that was a practical criticism of that particular method of measuring the cost of living. He did not think there was any misunderstanding in the public mind when they took the *Labour Gazette* figures and saw prices had gone up so much, and therefore, argued that the cost of living had gone up so much. If they applied the *Labour Gazette* method to those circumstances, which, as he had stated, would have obtained if the submarine campaign had continued, they would see it was not so crude as the Sumner method, because at the end of the period prices would have gone up say 300 per cent., and the people would not have been able to buy *because* they had gone up 300 per cent. Therefore, that price measurement, crude as it was, would have expressed the truth, namely, that prices had gone up 300 per cent., and wages, for the sake of argument, had gone up 100 per cent., and people were starving, because with the 100 per cent., they could not meet the 300 per cent. Therefore, crude as it was, the *Labour Gazette* method better expressed the truth than all those refinements which put aside the real facts of the case and the real living man and woman who had to buy. On the whole he rather agreed with Professor Gonner that, in the circumstances of the case, having regard not only to the fact that those *Labour Gazette* figures had been used before the other method was thought of, and also having regard to those criticisms of which he had spoken, which did not originate with him but with the Labour Leaders themselves, who were quite able to judge of those matters, it was perhaps just as well that the members of the War Cabinet did not meet the Labour Leaders armed with a copy of the Sumner Report. He had been critical, but after all they were times when they must be frank about matters of that kind. They affected millions of people. The public had not had time to read this Paper, but probably some one would pick out of the Paper for them the purple passage in which the theory was summarised. This was another case bearing upon the division of property, and there would be all sorts of paragraphs to point out that railway men had had too much and miners had had too much, and the Government had made a hideous mistake and given away millions of pounds it ought not to have given away. He therefore felt that they wanted to be exceedingly careful on the matter, and he asked Dr. Bowley if he would be good enough, in the passage of which he had spoken, to put in some few words by way of further explanation, so that when they were quoted some of the reservations which appeared in the actual Paper might also appear. After saying what he had by way of criticism, he wished to thank Dr. Bowley very sincerely indeed for the Paper, because it was right that they should enquire most carefully into the best method of arriving at the cost of living.

Dr. Bowley, in reply, said that Sir Leo had identified him with the Report of Lord Sumner's Committee, and in a sense he must accept that identification, because he signed the Report; but there were many other signatories who were equally responsible for anything that appeared therein. He had noticed that Sir Leo always praised his methods when he happened to agree with the results, but always said they were the crudest kind of nonsense if he did not approve of them. He quite agreed that neither the Sumner Report on the cost of living nor his Paper could be understood by a Labour Leader or a Member of Parliament while travelling between Charing Cross and Temple Station, though he thought it was quite probable that the Press between the evening and the morning would be able to digest its main contentions. He did not think the difficulty was in any way to be avoided; every person in the room would have realised after hearing his Paper that the measurement of the cost of living was by no means a simple conception. Nobody would expect that a difficult question of engineering or a nice point of art could be put in the Press and explained in words ot one syllable and in a single sentence. He could not see that the fact that a thing was difficult was any justification for any Government Committee or Department shirking the question. If when it came to make practicable decisions they were bound to convince their opponents it might very well be that the judgment went somewhat astray from the evidence, because the thing had to be smoothed out and slurred ovei; there had to be conciliation. He thought that was the position as to the measurement ot the cost of living, and the very fact that in different countries different methods had been taken and different results obtained, showed that there was no one method that could be understood by everybody and was of universal application. With regard to the quotations from the Report of the Sumner Committee and the sad fate that would have happened to the nation if there had been no food at the end of 1917, his first remark was that if there had been no food people would have starved, whether the Labour Index-Number was admitted or any other. If there was insufficient food, it would have been a question of adequacy of rationing, quite irrespective of the Index Numbers of prices. But the Sumner Report never made any recommendation which by any careful reader could for a moment be construed as meaning anything of the sort. The Sumner Report, when it spoke of the result of expenditure, always spoke of the standard obtained. In the most essential part of the Report, it was stated that the rise of expenditure to July, 1918, was 74 and just below that the standard measured in calories had gone down 3 per cent. If the standard had proved to have gone down 50 per cent., he could assure them that he would not have signed the Report without taking very great care to give prominence to the fact. He had applied those methods long before the war, and he might say that consideration of the change of quantities purchased had always been an essential part of the measurement that was made. One of the factors was change of expenditure, and a second factor was change of standard; how to combine the two was the question that those who had to make the determinations on that basis had to face. It was the duty of Sir Leo and other persons who wished to use it to read through the 40 paragraphs of the Committee's Report when they had time to think about it, and as he fully assented that Labour Leaders were perfectly capable of understanding it, he also hoped that if they had occasion to quote from it they would also first read it. That brought him to one of the points raised by Professor Edgeworth, who asked why he preferred the "q" to "Q." The reason in essence was that the "q" measured what could be obtained now, while the "Q" referred to some things which would have gone right off the market, so that the "q" always gave the real and practical result, while the "Q" would at the present moment involve an infinite or at least an indefinite term; for if, as at present, butter was unobtainable, "P" was infinite. He also gave reasons to which he really attached more importance than anything else in the paper by saying that the measurement using "q" did show that the same satisfaction could be obtained by the appropriate expenditure, and always gave a reasonable result; whereas "Q" might in times of rapid change lead to impossible results. There was one point he wished to clear up on Professor Edgeworth's remarks. He had spoken of a certain difficulty in the precision of the average because there were a limited number of classes; but the great difficulty about that collection of budgets, and, he thought, of other selections, was not that they were obtained from a few interdependent classes, but that the variation was so great that they could not easily be classified, and all grouping into classes was inexact and artificial. He had sufficient faith to hold that the precision, though not quite so great as the theory gave it, was at any rate of quite a high order.

Note.—Time did not allow a reply to Professor Gonner's questions at the meeting. The 1914 Budget was obtained from those of 1904 by modifying prices and quantities in accordance with general statistics of retail prices and consumption; the alterations were inconsiderable, and the evidence of the statistics of the Ministry of Food (paragraphs 27 *seq.* of the Cost of Living Report) confirmed their general accuracy.

The originals of the earlier Budgets were studied and it appeared that they came from groups of artisans and labourers similar to those included in 1918; but analysis showed that a slightly larger proportion of skilled men were included in 1918, and allowance was made for this (section 34 of the report) before the final statement of increase. There seems no reason to doubt that the Budgets in 1914 and 1918 are strictly comparable, though they may both refer to expenditure above the general average.—A.L.B.

The following Candidates were elected Fellows of the Society:—

Lieut. J. F. Goaman (representing the Chamber of Horticulture).
H. A. Bennie Gray.
Allan Greenwell.
E. S. Napier (representing the Zionist Organisation).
J. S. M. Ward (representing the Federation of British Industries).

CROP-CYCLES IN THE UNITED KINGDOM AND IN THE UNITED STATES.

By HENRY L. MOORE,
Columbia University, New York.

THE results which are about to be described are intended to furnish evidence that the yield of the leading cereal crops in the United Kingdom tends to vary in well-defined cycles, and that, as far as the statistics of the two countries are comparable, the crop-cycles in the United States tend to synchronize with those of the United Kingdom.

I.

The early literature bearing upon the theory of the meteorological origin of industrial and commercial cycles has been traversed by Jevons in three classic essays. According to his account, Sir William Herschel's attempt to find a relation between the frequency of sunspots and the variations in the price of corn probably marked the introduction of the hypothesis. The subsequent development of the theory he describes as follows :—

" Hyde Clarke, Wilson, and Danson all argued, some thirty or " forty years ago, that commercial fluctuations must be governed " by physical causes. But here we are embarrassed by the fact " that no inquirer has been able to discover a clear periodic varia- " tion in the price of corn. . . . The fact is, I believe, that cereal " crops, as grown and gathered in Europe, depend for their success " upon very complicated conditions, so that the solar influence is " disguised. But it does not follow that other crops in other latitudes " may not manifest the decennial period." " Thoroughly biased " in favour "[1] of the hypothesis of a ten-years' cycle, Jevons turned aside from the study of European agricultural conditions and elaborated his ingenious theory of the dependence of the European economic rhythm upon Oriental trade, which, in turn, was held to vary with the bounty or the failure of harvests in the East.

After Jevons' three essays, the next important investigation relating to cycles was Professor J. H. Poynting's paper, which was read before the Statistical Society, and subsequently published in its *Journal* with the title "A Comparison of the "Fluctuations in the Price of Wheat and in the Cotton and "Silk Imports into Great Britain."[1] To three points in his paper and the discussion which it evoked, I wish to call attention :—

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[1] W. S. Jevons: *Investigations in Currency and Finance*, pp. 228, 231.

1. Professor Poynting offered a valuable criticism of previous methods of inquiry : "The attempt to prove the sunspot origin of "variations of harvests and crops has probably led us somewhat "away from the proper line of inquiry. This, it seems to me, should "begin with such a manipulation of the statistics as to show the "true fluctuations whatever they may be, with the effects of wars, "increase of commerce, &c., as far as possible eliminated. Having "obtained these fluctuations for various commodities, we can "compare them with each other."[2]

2. In Professor Poynting's discussion of "The Direction of "Future Inquiry," he thought that "the next step" should be "an investigation into any periodicities which may exist in the "price of corn."[3]

3. Several of Professor Poynting's critics urged that prices of corn, affected as they are by so many causes other than the amount of the yield, would not, as Professor Poynting thought, afford the proper data for discovering periodicities, but that the yield per acre should be made the subject of investigation. In the official account of the "Discussion on Professor Poynting's Paper" the suggestion of one of the critics, Major Craigie, is reported in these words :—

"If they (the Statistical Society) could have a series of figures "constructed wholly of ascertained produce obtained by reliable "returns from different places it would be infinitely superior to "any money standard of actual prices. It was satisfactory to the "Society that the Government were about in this country at last "to rectify the omission on which he had felt it his duty to comment "in January last, and to attempt to have some official record of "the wheat produce of the United Kingdom and that of other "cereals. Professor Poynting could not, he knew, obtain yet the "data to determine the actual produce of the past, but when the "Statistical Society met 100 years hence, as he hoped it would do, "to discuss and elaborate such figures as they had been discussing "that evening, they would doubtless possess a far better basis from

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[1] *Journal of the Statistical Society,* March, 1884.

[2] *Ibid.,* p. 35.

[3] *Ibid.,* p. 43.

"which to compile any averages, namely, the actual produce in "different parts of the world."[1]

The publication of the statistics recording the yield of the cereals in the United Kingdom dates from the year of Professor Poynting's memorable paper, and the material had accumulated for a much shorter period than the century to which Major Craigie referred, when it was made the basis of a search for crop periodicities. Mr. W. N. Shaw, Director of the Meteorological Office, London, published in 1906, a paper on "An Apparent Periodicity in the "Yield of Wheat for Eastern England, 1885 to 1905."[2] His data referred only to the Eastern Counties of England, were limited to one crop and covered only twenty-one years, but keeping in mind the uncertainties that go with paucity of material, he seemed to have reason for feeling that he had discovered a cycle of eleven years.

If there are other investigations of periodicities in the crops of the United Kingdom, they have not come to my attention.

The results that I am about to describe relate to the three principal cereals of the United Kingdom, wheat, barley, and oats. The period covered by the statistics dates from 1884 to 1914, and the crude figures of yield per acre that were the basis of the computations refer to the United Kingdom, exclusive of the Isle of Man and Channel Islands. The sources of the statistics were the *Statistical Abstract for the United Kingdom* for 1882–96, p. 192; for 1896–1910, p. 303; for 1900–14, p. 316.

The crude figures[3] of yield were, for each crop, converted into index-numbers, of which the base was the mean yield for the ten years 1890–1899. That is to say, the yield of each year from 1884 to 1914, in the case of each crop, was expressed as a ratio to the mean yield of the crop for the period 1890–99. In Fig. 1 the index-numbers of the three crops are plotted, and the general trend of the numbers in each case is indicated by a curve of the type $y = a_0 + a_1 x + a_2 x^2 + a_3 x^3$, which was fitted to the data by the method of least squares. The deviations of each series of figures from its corresponding general trend were then obtained, and these deviations were made the basis of a quest for natural periodicities.

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[1] *Ibid.*, p. 72.

[2] *Proceedings of the Royal Society of London.* Series A., Vol. LXXVIII., pp. 69–76.

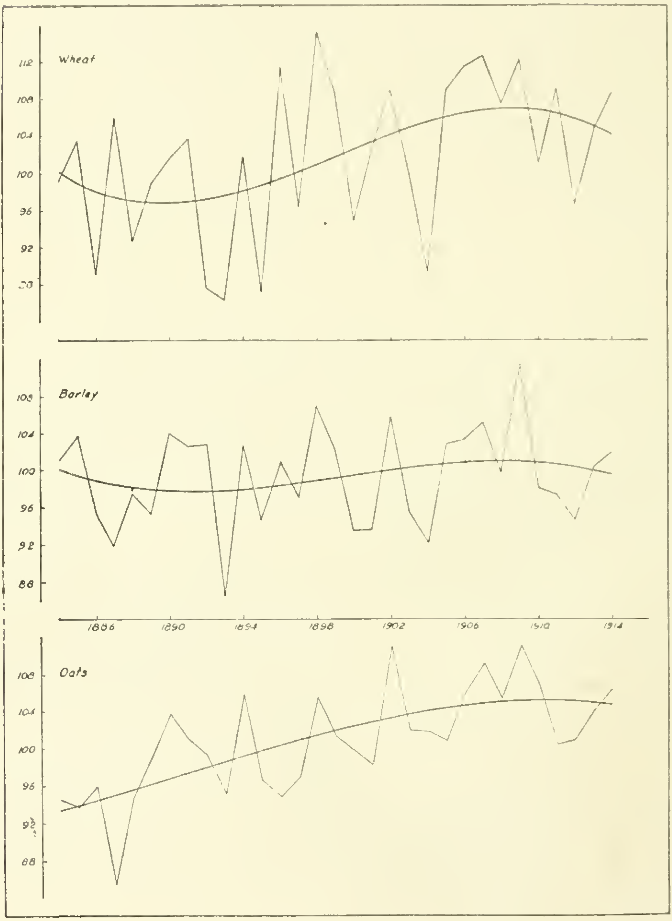
[3] The statistical tables underlying the computations and conclusions of this article are given in the Appendix.

FIG. 1.—*Index-numbers of the crop-yield in the United Kingdom.*

The yield of wheat:—
Trend, $y = 101\cdot7 + \cdot806x + \cdot0014x^2 - \cdot00302x^3$, origin at 1899.

The yield of barley:—
Trend, $y = 99\cdot2 + \cdot272x + \cdot0025x^2 - \cdot00128x^3$, origin at 1899.

The yield of oats:—
Trend, $y = 101\cdot9 + \cdot491x - \cdot0130x^2 - \cdot00053x^3$, origin at 1899.



The method of searching for periodicities was to exhaust all possibilities of cycles between three and twelve years, inclusively, both for the three crops combined and for the individual crops. Or, more concretely, as a first step in the problem, a curve of the type $y = A_0 + A_1 \sin\left(\frac{2\pi}{T}t + e_1\right)$ was fitted, by the method of least squares, to the means of the deviations of the three crops and to the deviations of the individual crops, for all values of T between three and twelve. After the amplitudes of the sine-curves were determined, periodograms[1] for the mean index of the three crops and for the index of each crop were constructed by plotting the squares of the amplitudes corresponding to the years between three and twelve.

Fig. 2 gives a description of the periodogram referring to the index of the mean deviations of the three crops. An examination of the graph shows that the maximum ordinates are at eight years and at four years, and, according to the theory of the periodogram, we infer that the most probable cycles in the crop-yield of the United Kingdom are cycles of approximately eight years and four years. Fig. 3 exhibits the compound cycle of eight years and four years fitted, by the method of least squares, to the mean deviations of the three crops.

FIG. 2.—*The periodogram of the crop-yield in the United Kingdom.*

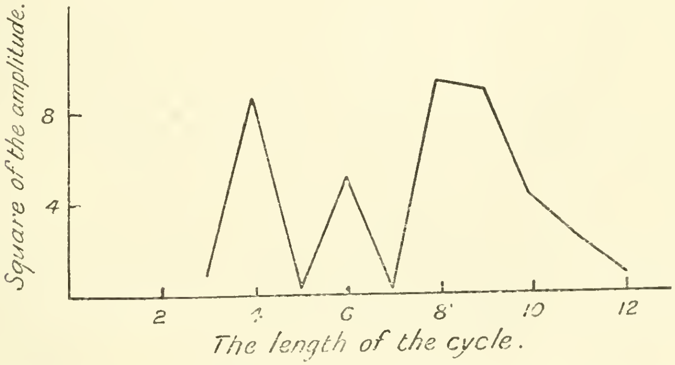


Fig. 4 exhibits the periodograms of the individual crops, and these disclose that, in the case of oats, the principal crop, cycles approximating to eight years and four years are well-defined; that in the case of barley, the eight years' cycle and its semi-harmonic of four years are clearly developed; and that in the case of wheat the maximum ordinates are at nine years and four years. It will be observed, however, that while a maximum ordinate for wheat is at nine years, the ordinates corresponding to eight years and ten years are large, and, consequently, although the exact length of the real maximum cycle for wheat is indefinite, it may reasonably be assumed to lie between eight and ten years.

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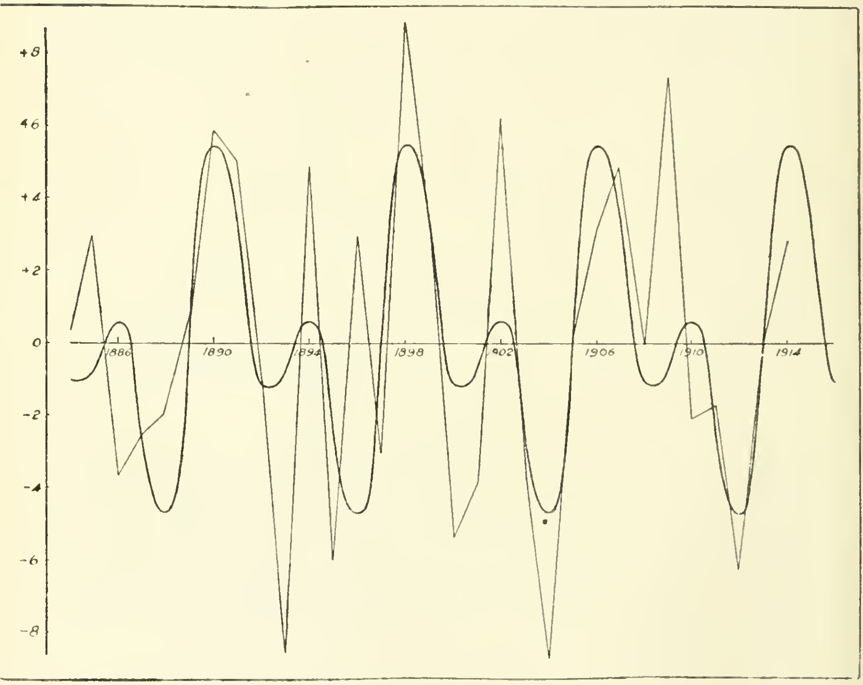
[1] The theory of the periodogram was developed by Professor Arthur Schuster, and, as far as possible, with my limited data, I have followed his method.

FIG. 3.—*Cycles in the yield of crops in the United Kingdom.*

Equation to the smooth curve:—

$$y = 0\cdot 14 + 3\cdot 02 \sin\left(\frac{2\pi}{8}t + 142°0'\right) + 2\cdot 94 \sin\left(\frac{4\pi}{8}t + 261°3'\right), \text{ origin at } 1884.$$



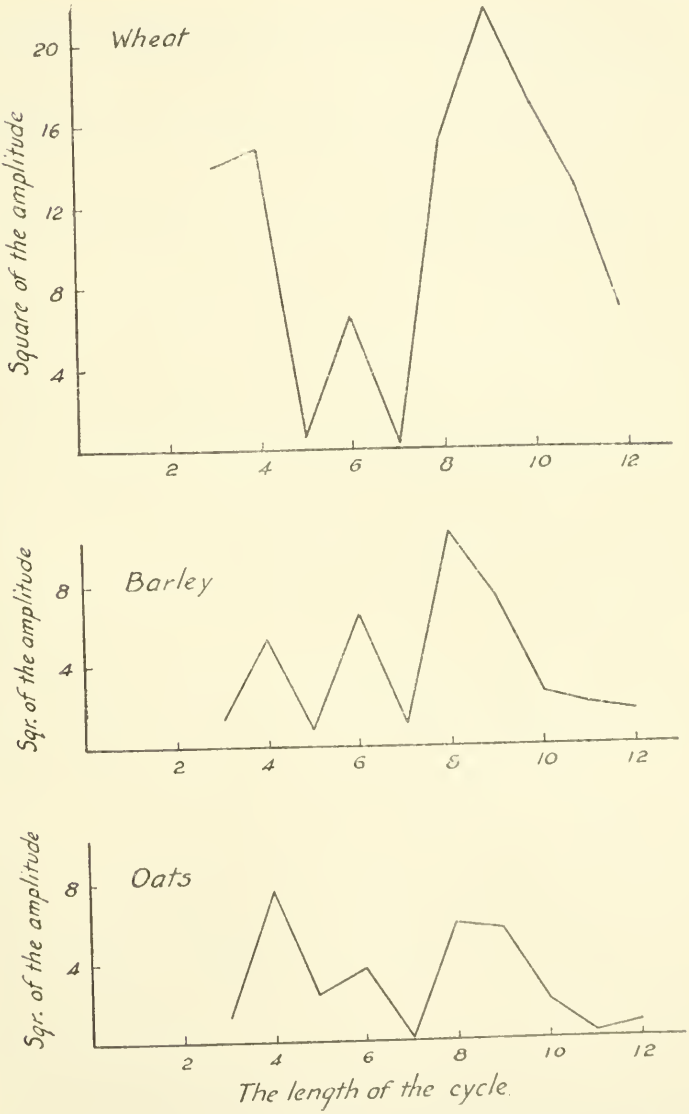


Fig. 4.—*Periodograms of the yield of wheat, barley, and oats in the United Kingdom.*

Fig. 5 displays compound cycles of eight and four years fitted by the method of least squares to the respective yields of the three crops. A comparison of Figs. 3 and 5 shows that compound cycles

Fig. 5.—*Cycles in the yield of wheat, barley, and oats in the United Kingdom.*

Cycles in wheat:—

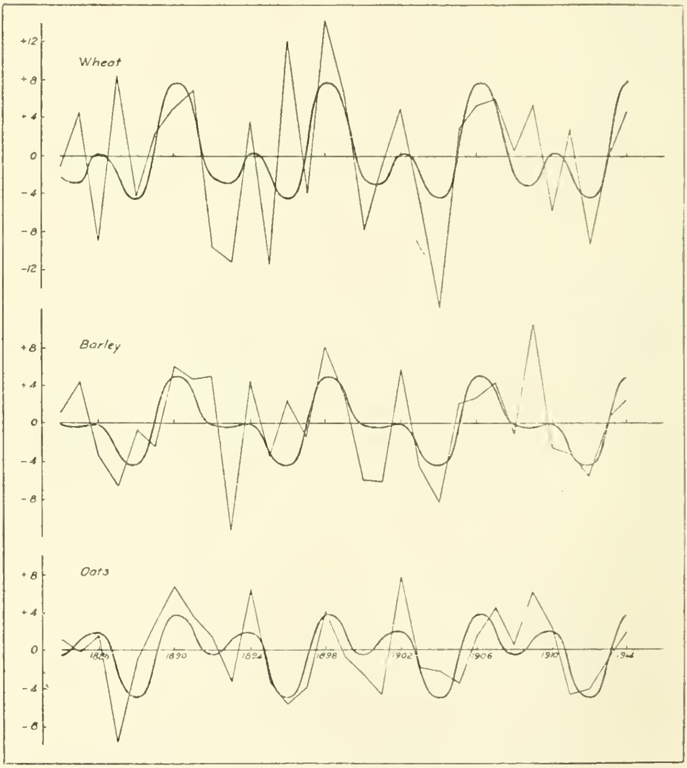
$$y=0\cdot 2+3\cdot 92\sin\left(\frac{2\pi}{8}t+162^\circ 16'\right)+3\cdot 88\sin\left(\frac{4\pi}{8}t+249^\circ 14'\right), \text{ origin at 1884.}$$

Cycles in barley:—

$$y=0\cdot 1+3\cdot 27\sin\left(\frac{2\pi}{8}t+139^\circ 23'\right)+2\cdot 30\sin\left(\frac{4\pi}{8}t+266^\circ 34'\right), \text{ origin at 1884.}$$

Cycles in oats:—

$$y=0\cdot 1+2\cdot 43\sin\left(\frac{2\pi}{8}t+112^\circ\ 1'\right)+2\cdot 78\sin\left(\frac{4\pi}{8}t+272^\circ 50'\right), \text{ origin at 1884.}$$



of eight and four years—which, according to the periodograms of Figs. 2 and 4, are the most probable constituent cycles in the crops of the United Kingdom—give descriptions of the data that are strikingly similar in the individual crops and the mean index of the three crops. In all cases the principal maxima are nearly at 1890, 1898, 1906, 1914, and the secondary maxima are about midway between these years.

II.

At the present time I shall not be able to deal as exhaustively with the American data as I have with the crop statistics of the United Kingdom. But I should like to submit three pieces of evidence suggestive of an American crop variation that is synchronous with the crop rhythm of the United Kingdom.

1. In an essay on *Economic Cycles*, I began the study of periodicities with an investigation of the rainfall in the Ohio and Mississippi valleys, the chief grain-producing area of the United States. For an interval of seventy-two years, from 1839 to 1910, the annual rainfall data of the Ohio valley were examined with a view to discovering regular variations, and a periodogram[1] was constructed for all possible cycles between three and thirty-six years. The computation revealed a well-defined cycle of about eight years and a cycle of smaller amplitude of about thirty-three years. A fair description of the general cyclical trend of the data was obtained by combining the eight-years' cycle and its semi-harmonic of four years, with the thirty-three years' cycle and its third harmonic of eleven years. In Fig. 6 of the present article the compound cycle of eight and four years in the rainfall of the Ohio valley may be compared with the compound cycle of eight and four years in the crop-yield of the United Kingdom.

2. For many years before the beginning of the war in 1914, the chief agricultural export of the United States, and a most essential import into Great Britain, was cotton. Fig. 7 gives the periodogram[2] of the yield per acre of cotton in the United States for the years 1882 to 1914, and the run of the graph suggests a cycle in the yield somewhere in the neighbourhood of seven years. Whether the indefiniteness in the periodogram is due to a real indefiniteness in the natural cycle, or to a distortion following upon the ravages of the boll-weevil, or to the opening up of new cotton lands, we are not at present able to determine. If the cycle be regarded as of eight years in length, the bottom graph in Fig. 6 will show how the compound cycle of eight years and four years in the yield of cotton compares with the corresponding compound cycles referring to

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[1] The periodogram, together with other rainfall graphs, may be found in Chapter II. of *Economic Cycles: Their Law and Cause.* 1914.

[2] The equation descriptive of the general trend of the yield from 1881 to 1915 is $y = 182{\cdot}03 + {\cdot}586\,x - {\cdot}0230\,x^2 + {\cdot}00040\,x^3$, origin at 1898. In constructing the periodogram, the deviations from this trend were made the basis of the computation.

FIG. 6.—*Cycles in the crops of the United Kingdom, the rainfall of the Ohio Valley, and the yield of cotton in the United States.*

Cycles of crops in the United Kingdom :—

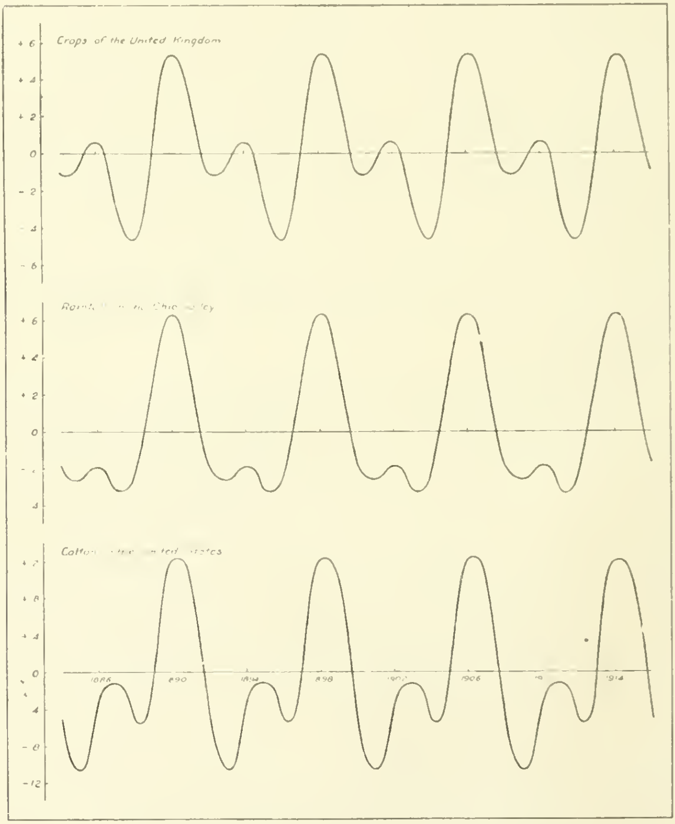
$$y = 0 \cdot 14 + 3 \cdot 02 \sin\left(\frac{2\pi}{8}t + 142^\circ 0'\right) + 2 \cdot 94 \sin\left(\frac{4\pi}{8}t + 261^\circ 3'\right), \text{ origin at 1884.}$$

Cycles of rainfall in the Ohio Valley :—

$$y = 4 \cdot 13 \sin\left(\frac{2\pi}{8}t + 310^\circ 41'\right) + 2 \cdot 14 \sin\left(\frac{4\pi}{8}t + 180^\circ 28'\right), \text{ origin at 1839.}$$

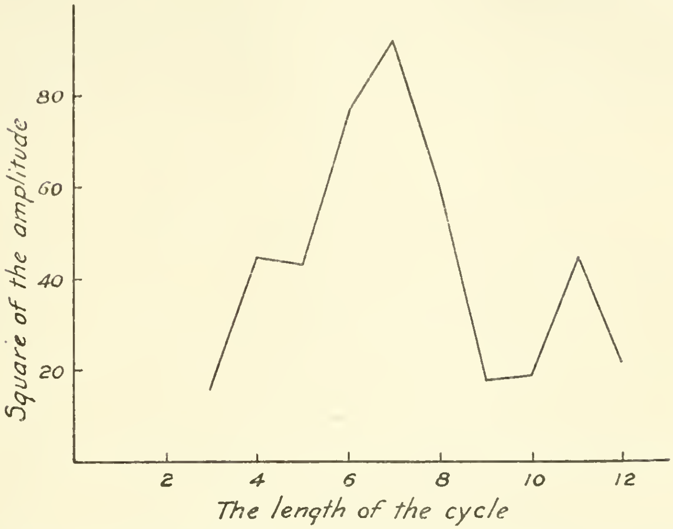
Cycles of cotton-yield in the United States :—

$$y = -0 \cdot 44 + 7 \cdot 70 \sin\left(\frac{2\pi}{8}t + 44^\circ 25'\right) + 6 \cdot 67 \sin\left(\frac{4\pi}{8}t + 316^\circ 4'\right), \text{origin at 1881.}$$



the crops in the United Kingdom and to the rainfall in the Ohio valley. In all three cases the maxima occur at about the same years—1890, 1898, 1906, 1914. If the major cotton cycle had been

Fig. 7.—*The periodogram of the yield of cotton in the United States.*



assumed to be seven instead of eight years, the cotton maxima would have been at about 1891, 1898, 1905, 1912.

3. The third piece of evidence bears upon the cycles in the yield of the nine leading crops in the United States—corn, wheat, oats, barley, rye, buckwheat, potatoes, hay, and cotton. In the essay on *Economic Cycles* an index-number of the yield per acre of the crops was constructed by combining the index-numbers of the separate crops. The yield of each crop for each year was expressed as a ratio to its mean yield for the ten years 1890–99, and in combining the individual index-numbers, weights were given to the several series proportionate to the respective values of the crops in 1911. In order to bring out the larger cyclical movements in the combined series, the smaller fluctuations were eliminated by forming a progressive or moving average of three years. That is to say, each three consecutive values in the combined series were averaged, and the results were regarded as applying to the middle year to which the respective quotations referred. The effect of this method of smoothing, as Professor Poynting[1] and Professor Stokes have indicated, is to reduce the amplitude of the cycles whose periods approach the range of the moving average. In the case of the yield of the nine crops, the three years moving average would tend to obliterate any possible four-years' cycle, and we should not, therefore,

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[1] *Journal of the Statistical Society*, 1884, pp. 45–47, 74.

expect to find evidence in the smoothed series of a four-years' cycle. By way of compensation, if there should be an eight-years' cycle, it would, by this method of smoothing, become more clearly defined. In Fig. 8, the bottom graph exhibits an eight-years' cycle that is fitted, by the method of least squares, to the deviations from

FIG. 8.

Cycle in the yield of three crops in the United Kingdom :—

$$y = 3 \cdot 02 \sin\left(\frac{2\pi}{8}t + 142^\circ\ 0'\right), \text{ origin at } 1881.$$

Cycle in the rainfall of the Ohio Valley :—

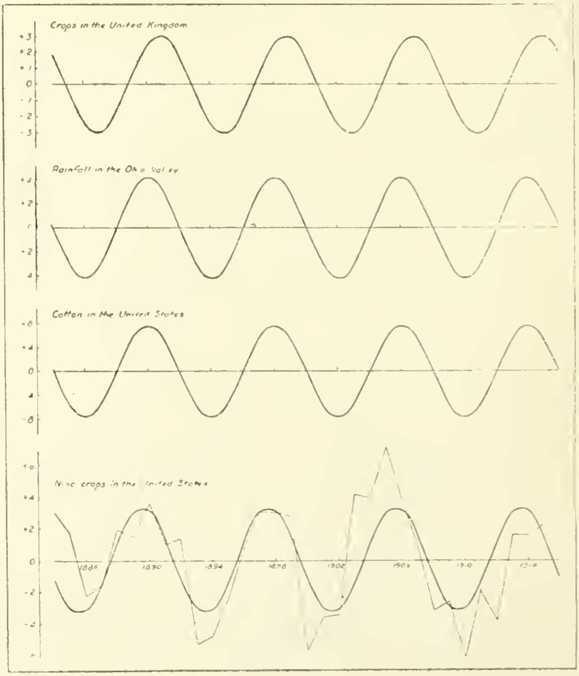
$$y = 4 \cdot 13 \sin\left(\frac{2\pi}{8}t + 310^\circ 41'\right), \text{ origin at } 1839.$$

Cycle in the yield of cotton in the United States :—

$$y = 7 \cdot 70 \sin\left(\frac{2\pi}{8}t + 44^\circ 25'\right), \text{ origin at } 1881.$$

Cycle in the yield of nine crops in the United States :—

$$y = 3 \cdot 31 \sin\left(\frac{2\pi}{8}t + 200^\circ 49'\right), \text{ origin at } 1884.$$



the general trend[1] of the smoothed index-numbers of the yield per acre of nine crops in the United States. For the purpose of comparison, Fig. 8 exhibits the eight-years' cycles in the yield of the crops in the United Kingdom, the rainfall in the Ohio valley, the yield of cotton in the American Cotton Belt, and the index-numbers of nine crops in the United States. In all four cases, the maxima occur in the neighbourhood of 1890, 1898, 1906 and 1914.

III.

With regard to the results that have been described, I have tried to avoid what an eminent economist has called *la faute de trop préciser.* The methods employed to ascertain the existence of periodicities are exquisitely refined, while some of the data to which they have been applied are notoriously inexact. It would be rash to maintain that there are well-established, invariable meteorological cycles; rasher still to urge the permanence of any agricultural series derived from inexact estimates covering a limited period; and rashest of all to hold to a perfect sequence of meteorological, agricultural, and economic cycles. My aim has been to point out fundamental agreements, and for that purpose it seemed wise to steer clear of any arbitrary, improvised procedure and to measure by well-tried methods the elements in the problem.

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[1] The equation to the general trend of the smoothed index-numbers from 1881 to 1915 is $y = 103 + \cdot 947\,x + \cdot 0029\,x^2 - \cdot 00193\,x^3$, origin at 1898.

APPENDIX.

TABLE I.—*Yield per acre of crops in the United Kingdom, exclusive of the Isle of Man and Channel Islands. In the index-numbers, mean yield for years* 1890–99 = 100.

Year.	Wheat.		Oats.		Barley and Bere.	
	Bushels (imperial bushels).	Index-number.	Bushels (imperial bushels).	Index-number.	Bushels (imperial bushels).	Index-number.
1884	29·90	99·1	37·85	94·5	34·21	101·0
85	31·24	103·5	37·58	93·8	35·18	103·8
86	26·89	89·1	38·46	96·0	32·32	95·4
87	31·97	105·9	34·25	85·5	31·12	91·9
88	27·97	92·7	37·95	94·7	33·03	97·5
89	29·89	99·0	39·75	99·2	32·37	95·5
1890	30·66	101·6	41·54	103·7	35·23	104·0
91	31·30	103·7	40·46	101·0	34·72	102·5
92	26·48	87·7	39·82	99·4	34·78	102·7
93	26·08	86·4	38·14	95·2	29·30	86·5
94	30·70	101·7	42·34	105·7	34·77	102·6
95	26·33	87·2	38·67	96·5	32·09	94·7
96	33·63	111·4	37·97	94·8	34·16	100·8
97	29·07	96·3	38·84	97·0	32·91	97·1
98	34·75	115·1	42·27	105·5	36·24	107·0
99	32·76	108·5	40·57	101·3	34·64	102·2
1900	28·61	94·8	39·97	99·8	31·67	93·5
01	30·93	102·5	39·35	98·2	31·70	93·6
02	32·91	109·0	44·50	111·1	35·83	105·8
03	30·15	99·9	40·81	101·9	32·38	95·6
04	26·97	89·4	40·80	101·8	31·25	92·2
05	32·88	108·9	40·38	100·8	34·79	102·7
06	33·69	111·6	42·45	106·0	35·00	103·3
07	33·98	112·6	43·76	109·2	35·64	105·2
08	32·42	107·4	42·22	105·4	33·79	99·7
09	33·85	112·2	44·49	111·1	37·73	111·4
1910	30·48	101·0	42·93	107·2	33·24	98·1
11	32·96	109·2	40·22	100·4	32·92	97·4
12	29·13	96·5	40·44	100·9	32·10	94·7
13	31·67	104·9	41·72	104·1	34·01	100·4
14	32·77	108·6	42·63	106·4	34·48	101·8

TABLE II.—*Deviations from their general trend of the index-numbers of yield per acre of crops in the United Kingdom.*

Year.	Crops.			Unweighted mean.
	Wheat.	Oats.	Barley and Bere.	
1884	− 1·1	+1·1	+ 1·0	+0·3
85	+ 4·5	− 0·2	+ 4·4	+2·9
86	− 9·0	+1·5	− 3·5	−3·7
87	+ 8·4	−9·6	− 6·6	−2·6
88	− 4·4	−1·0	− 0·7	−2·0
89	+ 2·2	+2·9	− 2·5	+0·9
1890	+ 4·8	+6·8	+ 6·1	+5·9
91	+ 6·8	+3·5	+ 4·7	+5·0
92	− 9·5	+1·4	+ 4·9	−1·1
93	−11·2	−3·4	−11·4	−8·7
94	+ 3·6	+6·5	+ 4·6	+4·9
95	−11·5	−3·3	− 3·5	− 6·1
96	+12·0	−5·6	+ 2·4	+2·9
97	− 3·9	−3·9	− 1·5	−3·1
98	+14·2	+4·1	+ 8·1	+8·8
99	+ 6·8	−0·6	+ 3·0	+3·1
1900	− 7·8	−2·6	− 5·9	−5·4
01	− 0·8	−4·7	− 6·1	−3·9
02	+ 4·9	+7·8	+ 5·8	+6·2
03	− 4·9	−1·8	− 4·6	−3·8
04	−16·0	−2·2	− 8·2	−8·8
05	+ 2·9	−3·5	+ 2·1	+0·5
06	+ 5·2	+1·4	+ 2·6	+3·1
07	+ 5·9	+4·4	+ 4·4	+4·9
08	+ 0·5	+0·5	− 1·2	−0·1
09	+ 5·3	+6·1	+10·5	+7·3
1910	− 5·8	+2·1	− 2·6	−2·1
11	+ 2·8	−4·7	− 3·2	−1·7
12	− 9·3	−4·1	− 5·6	− 6·3
13	− 0·1	−0·8	+ 0·5	−0·1
14	+ 4·6	+1·8	+ 2·3	+2·9

TABLE III. *Computations referring to the periodograms of the yield per acre of crops in the United Kingdom, and of cotton in the United States.* A^2 = *the square of the amplitude of the specified cycle.*

Length of the cycle.	Crops in the United Kingdom.				Cotton in the United States.
	Wheat.	Barley and Bere.	Oats.	The three crops combined.	
	A^2.	A^2.	A^2.	A^2.	A^2.
3	13·9902	1·2011	1·2531	1·5584	15·5053
4	15·0313	5·2745	7·7473	8·6338	44·4306
5	0·4951	0·5998	2·3643	0·3481	43·2879
6	6·6277	6·4489	3·7445	5·0609	76·5857
7	0·1623	0·9176	0·0424	0·1388	91·8271
8	15·4007	10·7172	5·9056	9·1389	59·3120
9	21·7555	7·3753	5·4676	8·9935	17·3882
10	16·9521	2·5467	1·8652	4·2390	18·9101
11	12·9773	1·9955	0·1995	2·2470	45·0873
12	7·1230	1·6563	0·8349	0·8761	21·2860

TABLE IV.—*Yield per acre of cotton and its deviations from its general trend. Smoothed index-numbers of yield per acre of nine crops in the United States and their deviations from their general trend.*

Year.	Cotton.		Nine Crops in the United States.		
	Yield per acre.	Deviations from trend.	Index-numbers of yield per acre.	Smoothed index-numbers.	Deviations from trend.
1881	150	−13·5	—	—	—
82	186	+20·9	—	—	—
83	165	− 1·7	97	—	—
84	154	−14·2	101	98·7	+3·0
85	164	− 5·6	98	97·3	+1·8
86	170	− 1·0	93	93·3	−2·2
87	183	+10·7	89	94·0	−1·6
88	180	+ 6·5	100	97·7	+1·9
89	177	+ 2·4	104	97·7	+1·5
1890	187	+11·3	89	100·3	+3·6
91	179	+ 2·3	108	98·3	+1·1
92	209	+31·4	98	99·3	+1·4
93	149	−29·5	92	93·3	−5·3
94	192	+12·7	90	94·7	−4·8
95	156	−24·0	102	98·0	−2·3
96	124	−56·8	102	102·0	+0·8
97	182	+ 0·6	102	105·0	+2·9
98	219	+37·0	111	106·0	+2·9
99	184	+ 1·4	105	106·7	+2·7
1900	194	+10·9	104	99·3	−5·7
01	169	−14·6	89	102·3	−3·6
02	189	+ 5·0	114	103·3	−3·5
03	175	− 9·4	107	111·7	+4·1
04	205	+20·2	114	112·3	+3·9
05	186	+ 0·9	116	116·3	+7·1
06	203	+17·6	119	113·7	+3·9
07	178	− 7·7	106	111·3	+0·9
08	195	+ 9·0	109	107·7	−3·2
09	154	−32·2	108	108·7	−2·6
1910	171	−15·4	109	105·3	−6·2
11	208	+21·4	99	109·7	−1·9
12	191	+ 4·2	121	107·7	−3·9
13	182	− 5·0	103	113·0	+1·6
14	209	+21·8	115	112·7	+1·6
15	170	−17·3	120	112·7	+2·2

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*Cours d'Économie Politique*. Par C. Colson. *Livre Premier. Théorie Générale des Phénomènes Économiques.* 547 pp., 8vo. Paris: Félix Alcan, 1915. Price 7 francs.

The author of this large treatise has apologised for adding to the number of existing manuals. The excuse supplied, in his first book alone, should win the gratitude of many readers. For M. Colson has conceived his subject from the fresh standpoint of those preparing to be engineers. With their needs in view on the one hand abundant use was made of facts, with explanations of questions of civil or commercial law, of business and finance, embraced in other courses of instruction followed in faculties or schools of commerce. But, as he says and we agree, these are also essential, or at least conducive, to a full understanding of economic life. On the other theoretical side, apart from such practical considerations, he enjoyed a special advantage in addressing engineers. They might be presumed to be familiar with the mathematical methods and arguments that have become conspicuous at any rate in what he treats appropriately as the "central" theory round which economic phenomena tend to be grouped. That is the theory of value and of prices, which, he aptly says, "envelops" all. In this particular connection he reveals the moderation, and exerts the wise restraint, characteristic of his general attitude which, we are sure, in that respect must appeal to tyros and to veterans, to teachers and their pupils. For he urges strongly that, as unknown factors are usually not more numerous than those allowing scrutiny and measurement, an opportunity is opened in economic theory for mathematical conception, and for the graphic presentation like the curves appearing frequently upon his pages where he deals with supply and demand.

But no less firmly does he retain a qualifying notion of the whole position. He considers that the data to be reckoned in economic reasoning are too many, and too little known, to permit safely of more than broad generalisation. Economic truths, he remarks, holding a just balance between two extremes, cannot be completely and precisely reached, or satisfactorily expounded, by such instruments; but, through analogies, the character of some may thereby be brought into bolder relief. Numerical "equations" are impossible; nor does he attempt to apply the "calculus."

The "course" of economic teaching, thus conceived and regulated, devised and mapped in the first instance some twenty years ago for students of the "École nationale des Ponts et Chaussées" by the "Inspector-General" of such works, was reviewed by him in the fresh light of instruction given afterwards to a wider class of pupils, to whom M. Colson lectured in the "École libre des Sciences Poli-"tiques." But it is interesting and significant to note that he then tried, and abandoned, the experiment of closer adherence to the traditional order of discussion on the lines of what might properly be called the "classical" divisions of the subject; and he returned to the new arrangement he had originally preferred. He did, however, develop at greater length his treatment of the theory of value, and he was convinced that a mathematical training need not precede the grasp of the graphic curves, some trouble in understanding which was indispensable to an exact idea of the theory of supply and demand. His book, accordingly, may, he hopes, possess an interest for ordinary students as well as the engineers for whose peculiar wants it was first prepared.

No less suggestive is another fact connected with the circumstances of the present later issue. Reaching an age when he would naturally wish to gather together all his economic studies into a definitive edition, M. Colson, writing in March, 1915, decided to employ alone the figures last available before 1914. For then occurred what he describes without exaggeration as a "bouleverse-"ment," both political and economic, produced in Europe by the recent war. The vast destruction wrought by the barbaric means of bestial savagery to which Germany resorted in that conflict, followed as it has been by revolutionary upheaval in other countries, has had a further consequence. The statistics of the years immediately after its close would not, M. Colson justly says, be "comparable" with those of the prior period stretching from 1816 to 1913. The wars of the French Revolution and of the Empire began a century of "marvellous progress"; and that has ended in the huge conflict which for our own country is wresting from the famed Napoleonic contest the exclusive title of "the "great war." Subsequent statistics accordingly, if used afterwards by M. Colson or by others, should be treated as starting from a point from which a "new state" of things has taken a fresh "departure."

In this opening volume, devoted to the "general theory of "economic phenomena," our author, we have noticed, leaves the order of arrangement followed usually by writers upon "principles," in which the production, distribution, exchange and consumption of wealth are successively discussed; or at any rate, if the succession had been modified, the separation was preserved. He states, by contrast, the opinion that some acquaintance with a general picture of the "economic movement" as a whole should precede closer scrutiny and definite formulation of the laws by which it is held to be determined. Otherwise a knowledge of what is to follow is virtually assumed in the treatment of what comes first. Thus he tries to show in proper order how natural agents, labour and capital co-operate, and furnish forces or articles to meet human wants, how liberty to work is the real basis of property in wealth, how things and services are exchanged under conditions governed by supply and by demand, of which value is the outcome, how *entrepreneurs* so group productive agents as to use them best with exchange in view, and how commerce hands the products thus obtained for consumption which is the final end of economic activity. To complete the picture thus drawn he adds, as an "inset" so to say, an "aperçu" of the part taken by disinterested conduct, and of the duties and behaviour and demeanour of the State, ensuring the free play of individuals or joining company with them as an occasion is offered or need requires. Having thus described in brief the various matters with which Political Economy is concerned he then proceeds to its methods, and to estimates of its worth, theoretically and practically regarded, and he considers afterwards the different standpoints from which the rôle of public authority can be viewed. They are, in effect, three in number, according as a "liberal," "socialist" or "interventionist" creed is held. The precise laws regulating the economic world under the influence of competition, which are next set forth, form, he correctly says, the theory of value. For that central theory, with its underlying conceptions and determining motives, can be carried from its simple elements into elaborate extensions, until ramifications spread so far as to cover the whole range of economic theorising. First treated in its general aspects it will show how the prices of products and services of every kind are fixed, and then particular applications can be made, and the remuneration of productive services successively disclosed, as the part due to the labourer, to the capitalist and to the proprietor of the land in the value resulting from the collaboration of the three is in turn regulated. Finally M. Colson explains in what economic progress consists in a *régime* of liberty, and he points out instructively how impotent are the acts of "intervention" of public officials, or the "transformations" which shape the dreams of socialists, to quicken appreciably the pace of this advance. They may indeed obstruct and retard.

Such is a summary, largely in the author's language, of what is elaborately set forth in this first book on the "general theory of "economic phenomena." The plan adopted is appropriately simple and clear. The prefatory sketch is an agreeable innovation recommended by its interest and its usefulness. The prominence of the theory of value, imparting unity to the whole scheme of reasoning and emphasising that action and reaction which, M. Colson remarks, constitute economic life, accords with modern developments of systematic thought. The firm attachment to individual liberty, the grudging distrust with which State "interference" is regarded, and reluctantly admitted, and the suspicious attitude adopted to the imaginative visions of socialistic venturers, may have been pushed to an extreme by a noted group of his countrymen influential in economic circles. But much that M. Colson himself says here has not ceased to be plain truth, which can be pressed opportunely when the facile trend of popular belief is prone, heedlessly perhaps, to incline in a reverse direction. Some peremptory warning of dangers, recognised once but now forgotten, or of grave difficulty and serious disadvantage overlooked or ignored, may not be out of place in these days: and M. Colson's plea is temperately couched, if it is vigorously urged, and it is an evident outcome of a sure belief.

That for the purpose of forty lessons, each of an hour and a half's duration, abridgement and omission have been necessary in this book will be obvious. Few readers probably will regret that by decisive choice between alternative definitions of the terms employed discussion which has been often wearisome or arid, and is usually inconclusive, is avoided. Nor will many deprecate the firm selection, without pursuing far their development or their illustration, of the principal arguments advanced for and against the conclusions reached on great questions. Common essential characteristic traits in the ideas of different schools are noted without entering on numberless divergencies for which various disciples are responsible. No full apparatus of bibliography, or of references and quotations, is attempted. But the connection between matters which may appear to be independent, the bonds linking together divers phenomena, and the numerous points of view that may be taken on affairs and problems of importance, are duly marked. M. Colson, thrusting aside as idle or wrong any pretence to "orthodoxy," simply aims at putting readers who desire to push their study further in such a position after listening to him that they will not forget, and cannot disregard, essential elements in the questions which they handle, and must appreciate the chief bearings of the topics they consider. This is a laudable ambition for which he can be congratulated.

We have not sufficient space to follow his treatment in detail. But we may hope to convey by some allusions an idea of the measure of success attained. The choice is aided by the convenient practice of printing in heavier type the definitions given and the summaries made of the main arguments. A broad account of wealth is, we believe, indicative of the spirit and the method of an expositor of economics; and with that M. Colson begins. He also points out, tersely but decisively, in reply to common socialistic reasoning, that no real distinction can be found between "conditions" of production, like machinery, and its "cause," which has been identified too narrowly with labour. He demonstrates the crucial importance of value in economics because, on the one hand, it is inseparably bound to the dominating economic act of exchange, to which it is fundamental, and, on the other, being measurable by price, it can become the basis of scientific reasoning and permit the regular formulation of economic "laws." It is, he shows, identical neither with utility alone nor with rarity exclusively, but nevertheless implies both. It is not absolute or intrinsic, but it is relative. "Value in use" and "value in exchange," once sharply contrasted by the older writers, reappear in the "subjective" and "objective" "utility" that are linked together by the later theorists. Demand and supply are subject to various influences besides competition, such as sentiment, the actual *milieu* amid which they operate, or legislation. *Entrepreneurs* direct and also run risks. Middlemen and speculators are not, properly considered, parasites. Luxury must be differently interpreted in differing environment. Altruistic action should be reckoned among the possible factors in the economic area as well as the administration of governments, central and local. Economic reasoning has to face difficulty due to individual liberty deflecting conduct from the normal rule, to the loose ambiguous use of common words to which science would fain impart more definiteness and precision, and to the intrusion of distorting passion in economic inquiry and debate. Its observations may be assisted by statistics, by past history and by comparative geography, all of which are liable to certain imperfections, but its experiments are confronted by the unwillingness of human beings to be experimented on and by their liability to vary. Yet its deductions rest on the legitimate assumptions of the constant powerful sway of personal interest and of continuous striving for a minimum of effort. The largest result at the least cost is a safe broad aim to attribute to economic action. The "economic man" is often, or indeed, generally, busy for his family as well as for himself, and the conception of the family may alter from age to age and race to race or clime to clime. The State possesses no mysterious special "clairvoyance" of its own which has been denied to its citizens; and economic progress, M. Colson has no doubt, is due to individual freedom and initiative, as the founders, and masters, of Economics have generally held and taught. Ricardo's theory of rent has never been "refuted," and no theory in all the social sciences has been based on so precise an analysis, or has received such striking confirmation from the facts in the most diverse circumstances.

To these *obiter dicta*, culled at random, some of which may not find full acceptance, we may add two larger examples. M. Colson furnishes a long list of different situations that can be presented in connection with the supply of goods; and his treatment, which is luminous and penetrating, is more complete than any we remember to have seen elsewhere. On the other hand he dismisses summarily the account of interest given by the Austrian Böhm-Bawerk, and he seems to minimise the importance of that addition at least to economic theory. It is described as "subtle" and "ingenious," but its critic suggests the possibility of varying valuations of the present and the future, which would disturb the uniformity of the contrasting estimate emphasised by Böhm-Bawerk. It is, he holds, conceivable that a future good may be more highly valued than a present good, and nothing like a discount charged or paid for the exchange of the latter for the former. M. Colson's knowledge, however, of economic literature is wide, and his judgment seldom, if ever, fails to be fair. The "first book" of his "course," which in some respects must, from its subject-matter, be the most important, or at any rate is not the least typical, seems as a whole to be as trustworthy for the accurate instruction it conveys as it is refreshing for the lively interest kindled and sustained. It takes a high place, which it has earned, beside older treatises; for it opened a new way of approach and the experiment was justified by success.

L.L.P.

2.—*Cours d'Économie Politique.* Par C. Colson. *Livre Deuxième : Le Travail et les Questions Ouvrières.* 531 pp., 8vo. Paris : Félix Alcan, 1917. Price 7 fr. 50 cents.

In this second volume of the definitive edition of his large systematic treatise upon Economics M. Colson devotes his great ability and assiduous pains to the study of Labour, and what are commonly grouped under the general title of "Labour Questions." They are, he says, most important, for they concern intimately a vast proportion of the whole community; and the difficulties they raise enhance their interest. To their handling he brings the ordered store of abundant knowledge of the facts, the sure judicial mastery of the salient arguments advanced on either side of vexed debates, the fresh suggestiveness of outlook which can recognise altering conditions, and the wise reluctance to discard the lessons taught by long experience, which were conspicuous pleasing characteristics of his introductory review of the whole area embraced in economic reasoning and research. The special attention given naturally to his own country does not exclude opportune comparison with others; and the inclination, which is not hid, towards individual liberty and self-reliant action allows room for some amount of necessary control or beneficial stimulus by governments.

But M. Colson, it is evident, is old-fashioned enough to dislike new-fangled belief in the universal need of official guidance, and he doubts the lauded omnipotence of the State; and he feels and shows little or no sympathy with socialist ideas and policies. He protests that the *école libérale*, to which he himself belongs, is not indifferent to the amelioration of the lot of the most numerous section of the people, and he maintains that the marked improvement of their fortunes, achieved in the past century in unprecedented measure, must not be thought to have yet reached its goal. But, he urges, neither legislative dictation nor violent revolution could, by a sudden stroke, accomplish what scientific discoveries, with their technical employment, the spread of education and the growth of capital. resuming their progressive stride when the terrible destruction of the war is past, would, with the co-operation of the will and work of all, by the development of general resources, perform assuredly in due time. He repudiates the so-called justice, which has recently gained vogue, that would pay the comer at the eleventh hour what is offered also to those who have borne the heat and burden of the day; that would bestow the same reward on the mediocre and on the better workman; that would conceal the bad record of the criminal to enable him to get the employment sought by the honest labourer; and subsidise the girl-mother with the grant refused to the wife abandoned by her husband; and would furnish the idle or the spendthrift in old age with resources approximating in amount to as much as a life of toil and saving would otherwise have been needed to provide. All this is good sense, and is not unwholesome truth; and it is more likely to be carelessly forgotten than inopportunely pressed at the time in which we live.

Though it is a particular region alone of economic action which is here explored, its boundaries are not narrow, and the survey is both comprehensive and detailed. The question of population and the conditions of the productivity of work are treated in Chapter I. In the next the different modes and means of organizing labour are examined and exhibited, and M. Colson then proceeds to a scrutiny into the terms of the contract made, the obligations laid thereby on the parties concerned. the possibilities of and penalties for infraction, and the character and behaviour of the tribunals empowered to deal with differences that may arise; and he investigates the rôle of combinations and of the State in such affairs. The subject of the following chapter is insurance, as it affects the working class; and the fifth deals with the part played by private charity and public assistance in the relief of labour in distress, while, in conclusion, the topic of improvement, as it has been wrought in the past, or is aimed at in the present. or may be expected in the future, in the lot of the labourers. receives due notice. We have thus, as a whole, a repertory of information on what can properly be regarded as the crucial problems of the present day, when the "claims" of Labour are forced on the attention of the public, and statesmen and politicians of all civilized countries are anxious to consult the interests of those working men who form the larger bulk of their possible supporters or conceivable opponents.

M. Colson, however, shrewdly sees and emphatically declares that it is a mistake to suppose or maintain, as much current controversy states, that any hard fast lines divide capital from labour. Most workmen possess some capital. and many are, in fact. by themselves, or through the associations to which they belong. by no means inconsiderable capitalists. There are, too, many grades in the crowded ranks of the labouring classes, and a continuous thread of connection, with the marked division between the skilled and the unskilled shading off into almost imperceptible divisions, with sub-divisions and cross-divisions, can be traced from pure handicraft to obvious brainwork. Small industry survives beside the tendency to large enterprise. especially in agriculture and in retail trade, and there are, too, not a few persons to be properly counted in a whole nation, economically summed, who are neither masters nor wage-earners. In France, above all, owing, M. Colson contends, to her lack of coal and to the comparative dispersal of her population, this is the actual state of things; and *morcellement* of landed property and the prevalence of "luxury trades" are significant indices. But a comprehensive survey, such as that here attempted, would discover and acknowledge that a large proportion, if not a clear majority, of the inhabitants of every country, when it is freed from an institution like that of caste. are at once. in a sense, capitalists and *entrepreneurs*, and manual and intellectual workers. The assertion at the outset of such pertinent truth may clash with popular persuasion, but it affords encouraging guarantee for the abiding value of the detailed inquiry which it introduces. M. Colson, though he has, as we have noticed, strong convictions of his own, which may meet pronounced hostility in some quarters and will not win complete assent in others, is firmly resolved to see things as they are; he would not force repugnant fact into fine accord with the complete requirements of a rounded theory.

The sequel fairly redeems the promise. As we turn over the pages we see repeated illustration of the admirable lucidity and agreeable charm with which, through the incomparable medium of the French language, the product of long study and wide knowledge is presented in compact neat order for quick, easy grasp by interested readers. But the sane balance of the judgment shown again and again is, we think, even more praiseworthy, and, had we space in this notice, we could quote many examples from any of the half-dozen chapters. The re-statement of the theory of wages, on the lines laid down in the previous volume, gives, for instance, neither too much nor too little weight among factors fixing the remuneration of the worker to the cost of subsistence; and M. Colson impartially rebukes one side for unwarrantably concluding from the later development by economists of that theory that an increase in prices can be properly viewed entirely apart from the possibility of injury to labour, and the other for regarding a position strongly buttressed by this single influence as practically immune from attack or weakness threatening elsewhere. It is in a similar mood, where a cool, close scrutiny of the evidence issues in a clear judicial summary. that the substantial advantage of the wage system, with its real guarantees for continued payment, and its various possibilities of adjustment and improvement, is demonstrated, and compared with the fair hope entertained and the sorry disappointment met in schemes of profit-sharing and in plans for self-governing workshops. Nor is M. Colson less careful or convincing in his treatment of industrial strife, of the causes and results of strikes and lock-outs, of the methods of their prevention, and of the part which has been, or can be, taken in such matters by trade unions, and associations of employers, and by the State. His handling of the subject of insurance seems to us particularly apt. It is certainly comprehensive, and the possibilities and limitations of effective action are thoroughly explored. The differences presented by sickness, disablement, old age and death, and by unemployment, are examined with unsparing penetration and are plainly exhibited. Nor would it, we believe, be easy to dispute effectually the force of the chief conclusions reached, however reluctantly, as we suspect, some may be allowed by ardent reformers or by sanguine statesmen and their political adherents. For M. Colson proves that, while insurance against death, or due provision for old age, are manageable problems, sickness and disablement and, *a fortiori*, unemployment, offer formidable, if not insuperable, obstacles to sure treatment, and he does not hide his view that amongst alternatives opened the action of the State is not the most practicable, desirable, or effective instrument to use. On public assistance and private charity he is, for English readers, illuminating in the opportunity his chapter offers for comparison between our own and foreign practice; and the amount of difference finally reached is not, perhaps, so great as might have been anticipated. But his keenness and his moderation, his comprehensiveness and minuteness, are evident here as in the final chapter on the subject of amelioration of the workmen's lot. They are, indeed, we would emphasize, welcome characteristics prominent throughout his writing. L.L.P.

3.—*The Economic Foundations of Peace.* By J. L. Garvin. xxiv + 574 pp., 8vo. London: Macmillan and Co., 1919. Price 12*s*.

The able editor of the *Observer*, who has now placed to his credit this brilliant view of "world-partnership as the truer basis of the "league of nations"—to quote the alternative statement of his subject on his title-page—might, had he chosen, have put there some lines of Emerson once similarly used by Henry Sidgwick. For the text of the rousing sermon addressed by Mr. Garvin, with the *élan* and *aplomb* familiar to his weekly readers, to the big statesmen, or to the intelligent popular opinion to which they may be supposed to pay due heed, as they strive to mould afresh the destinies of the world in working practice for the future, bears a resemblance to the moral of the fine theoretical reasoning offered in the *Principles of Political Economy*, with its large attention to the "art" of Economics, to the academic students of an earlier generation. The first, no less fitly than the second, could be expressed in the words:—

"'Tis the day of the chattel,
Web to weave and corn to grind:
Things are in the saddle,
And ride mankind."

The nicely adjusted tone, and the balanced "*piu moderato tempo*" of the cautious economist would indeed contrast with the sustained high pitch and accelerated pace of the sure journalist; and, if we may say so without offence, the "tricks" of Mr. Garvin's honourable profession enable him to extract the amplest force from matter that trained professors of Economics might be more reluctant to regard as settling the conclusions drawn in these enthusiastic pages. But their proper jealousy for the recognition of their studies in contemporary debate, and of their fit use in most dealings of civilised communities, must be gratified by the stress laid here on the economic factor. Our strenuous persuasive author claims, indeed, for his own a wise admixture of idealism, and he "denies the impeachment" of the materialistic interpretation of history, which has gained prominence from the famous but distorted reading of Karl Marx. Still from the first to the last sentence, through all five "groups" of chapters, and through most of the numerous sub-divisions employed in this treatise as in the special form of leading article favoured in the newspaper he edits, we are met by the elaborated impassioned plea advanced and pressed that the new longed-for structure of enduring peace will not be firmly based unless it is made to rest on foundations which can only be described as "economic."

The political and juridical aspects, hitherto regarded, will not, he urges, suffice; nor are they as important or determining. They cannot be treated so effectively; nor do they offer, and much less certainly do they guarantee, any lasting promise of a satisfying comprehensive issue of the efforts made. It is the economic considerations which are essential to a constructive policy; and the work of President Wilson and his colleagues in Paris, and his supporters in many, or most, countries will, in Mr. Garvin's view, remain imperfect if they are content with negative aims alone. We have then in this volume, with its clever *flair* for popular attraction, a serious connected thesis planned and developed along lines which should interest economists as well as have the direct immediate influence it is purposed to exert on the directors of the most tremendous of great affairs. The Covenant itself receives criticism in detail, although Mr. Garvin wrote in the interval between the first public announcement of the draft and the final disclosure of the emended form. As we know now too from the *Observer*, and might have anticipated from this book, the terms of peace offered to Germany at Versailles displeased its author, who has not hid his view that the end to be sought is not yet reached.

In the first of the five groups, in which his twenty-one chapters are arranged, Mr. Garvin argues that even before the war the mutual dependence of the great nations of the world in economic matters had been increasing, notably in the supplies of food and of necessary raw materials, and that in such familiar concerns as postal arrangements and railway communication international control had been introduced, accepted and extended.

He next proceeds to prove that, as the internecine struggle between the Entente and the Central Powers was increased in length, and enlarged in scale, joint organisations, whose official character and authority became more definitely declared and explicitly countenanced, while their range of influence was widened and intensified, were set up to deal with wheat and other cereals, with meat and various provisions for the fighting forces and the general public of the Allied countries, with munitions and with shipping; and they were in fact found indispensable to military success. International "rationing" was aptly translated from theory into practice in many departments of supply and demand.

To scrap such tested and approved machinery when the war was at an end would, in Mr. Garvin's mature opinion, have been gratuitous foolish waste; and hitherto during the transition period examined in the third group of chapters this abandonment has been shown to be, in some respects at least, impossible. The strong leaning of the Americans to individual liberty and our own resentment at the chafing bondage of official fetters have yielded to the admission of the paramount need for the continuance, or revival for the time at least, of some varieties of this authoritative "part-"nership" in economic dealings. It was, Mr. Garvin demonstrates instructively, the entry of the United States as belligerent which served to give "extraordinary range and interest" to the "inter-allied organisation for supply and transport and economic "victory in the war" itself. For the present relief of distressed populations in Europe, not merely among our enemies but also in allied and neutral countries, the Supreme Economic Council in Paris is at the moment regarded justly as the only effective instrument available for dealing with an urgent critical position.

Mr. Garvin, however, looks beyond the period of transition. One of his "chief endeavours" is to "show that for the permanent "objects of a peace system the common economic administration "employed by the Allies and America during the war," which, he claims, has been more fully described in his book than in any previous publication, "can be taken over by the League of Nations with "invaluable effect, even if the functions of the higher Councils and "the various Technical Committees are largely changed and their "business becomes consultative and advisory."

Such are the "foundations of peace" as he sees them surely laid; and, in the concluding chapters devoted to the study of some "key-questions," his argument implies a "restored Russia," and "full participation" of the United States in firm alliance with ourselves, and it excludes such continued hard treatment of Germany, "pent up" in her new borders, and deprived wholly of her previous over-seas possessions, as will bar the hope, before too long an interval, of due enjoyment of the benefits of economic world-partnership. The indemnity or reparation she should furnish must not be crushing, and she should have sufficient raw materials supplied as well as food allowed, though they be furnished with restrictions and with safeguards. The economic boycott, moreover, is in the future to be the most deadly weapon—the "surest arm," as Mr. Garvin says—of the league of nations, as in the past the economic blockade, through joint organisation made successively more complete, contributed its determining influence to the war. Transport by the air—the most novel feature of the recent struggle—is destined to "change the character of civilised intercourse and "communications"; and Mr. Garvin lays repeated emphasis on this particular influence. By its use "world-partnership," economically characterised, "would handle" the entire globe more as a whole. Thus, he is sanguine to believe, the "creative peace" could be made to offer more attraction to "every nation than war to any "nation"; and, avowedly, he "looks to inducements to keep peace "rather than to penalties for breaking it."

The case we have tried to summarize is cogently presented. The main contentions are not many, and they are powerfully pressed by deft repetition. Mr. Garvin contrives, ingeniously, if somewhat discursively, to bring into his narrative interesting topics, which may not indeed be extraneous but appear to raise side-issues. The disposal of the Middle East and the fate of Middle Africa might be so regarded by some critics. The International Labour Code, however, forms, undoubtedly, an integral part of the economic system contemplated; and the due consideration of the wise development and right control of Trusts is as obviously pertinent. This courageous suggestive essay in "constructive idealism," with its stout "material" supports was, we think, well worth the pains and the ability applied to its conception and performance; and we should be the last to doubt, or dispute, that the League of Nations would be powerfully reinforced by the aid of the economic motives here invoked. But, as we hinted earlier, we cannot feel sure that the encouraging conclusions reached are wholly guaranteed by the confident reasoning employed.

Mr. Garvin recognises frankly that pacificists have ere now rested their high hopes on economic ties to be bitterly disappointed by their failure to stop recourse to war. It seems to us, we must confess, bald assertion rather than convincing proof to say that the recent titanic strife has rendered obsolete all misgiving on this matter, because, we understand, it has caused that thorough clearing of the ground which was a requisite preliminary. It needs, indeed, much persuasion to accept the dictum that valid or illuminating argument is impossible, or irrelevant, from pre-war experience to post-bellum likelihood. The impassable gulf, we would suggest, is rather that opened by the position Mr. Garvin takes. Some obstinate questionings still recur. Is it inconceivable, we must ask, that friction should be found in the international economic arrangements to which our faith is henceforth pinned? Can we be certain that opportunity for differences will always be smoothly eased, or peaceably removed, by the methods recommended or the means employed? Or, again, will "things ride mankind," in contempt or defiance of unreason, springing from passion, or beget by prejudice, outside the economic sphere?

We must also remember that Mr. Garvin does no more than show that it was only towards the close of the fighting that some of the inter-allied organisation he lauds there so much had been brought into working, or had become fully effective, and there has therefore been little time to reveal possibilities of failure or of harm. In the dire stress we have been through we may have submitted willingly, or perforce, to restraint which we should not endure in less critical times, and officials, on their side, in international as in national undertakings and arrangements, may then have reached greater heights of zeal, capacity and incorruptibility, than the ordinary human nature of the average man can be reasonably expected to attain when patriotic fervour or common peril cease to be so compelling an incentive to do right and keep aloof from wrong. Even as it is, administration, it is to be feared, has sometimes blundered and has often wasted, and has hampered as well as irritated; and Mr. Garvin himself thinks and says that not a little of the State control with which we have latterly been too familiar must promptly go.

We feel too that, like many ardent reformers of the present day, he is inclined to exaggerate the ideal perfection of the mechanism he would retain, or devise, and to overlook the hard grit of the material it will encounter and the shortcomings of those who have to direct its revolutions. He himself perhaps is not so successful as he is slim in meeting the awkward jar threatened on trade-policy; and his reconciliation of old views and fresh opinions about imperial preference and free trade may be clearer and more satisfactory to himself than it may seem to critics and objectors. Another crux can be found in the future of armaments, as Americans and Britons interpret the vexed phrase of the "freedom of the seas," although Mr. Garvin cleverly suggests that the inevitable development of aeronautics will render this perplexity, like many other problems of the past, or present, an obsolete anachronism.

Yet such difficulties and doubts should not disturb the general impression made upon our mind by this timely contribution to a vital controversy. Mr. Garvin has justified abundantly his claim that he approaches the League of Nations from a fresh standpoint, and the avenue along which he has made his bold but shrewd advance invites the careful passage of economists. His own outlook commends itself by being neither short nor narrow, for he tries to descry and gauge factors which will alter an existing situation. We may then agree with him that the world-partnership he portrays so fully and so lucidly offers "constructive and reconciling possi-"bilities," and that it is "essential to any firm prospect of enduring "peace." If so, it becomes appropriately, as he contends, an "indispensable addition to political world-government."

L.L.P.

4.—*The War Debt and how to meet it, with an Examination of the proposed "Capital Levy."* By J. E. Allen. vi + 147 pp. 8vo., London, Methuen, 1919. Price 5*s.*

The honorary Secretary of the Committee appointed by the British Association to report on "The Effects of the War on Credit, "Currency and Finance," and also of the Sub-Committee on "Income Tax Reform," has in the course of his work reached definite personal views on certain aspects of the subject which are set out in this little work. He gives a fair account of the facts relating to the growth of war debt, and, passing over in silence any wisdom in the financial statecraft of the early days of the war, is censorious over the cry of "business as usual," and the failure of the Government to set a definite note of sacrifice at the outset by immediate increased taxation. The nation was early allowed to get into bad habits, and seeming to like them has never recovered. Mr. Allen is another writer of the school that thinks a bold policy of taxation might have enabled the Government to transfer to itself from its people (by taxes and loans) the necessary purchasing power at the existing currency level, and not to have manufactured its own purchasing power, thus imposing a hidden levy, quite unfair and uneven in its distribution, by raising prices. But he, like the others, gives no recognition to the psychological stimulus—albeit of a feverish and "unhealthy" kind—given to the productive world by constantly rising prices, with big profits on realized stock and forced output. Whatever fine deeds may have been done in industry for pure patriotism, solid profit-making provided the chief stimulus, as experience of the effects of the taxation of excess profits often proved. It is doubtful whether an unchanged level of prices could have coincided with the same economic activity. Mr. Allen raises the interesting question as to who first clearly taught in public that the real cost of the war must be borne while it was progressing, and that it could not be "thrown" on posterity, and seems to regard Mr. Withers and himself as the Darwin and Wallace of this episode. Probably other claims to priority may be made. He writes clearly and well concerning the true inwardness of war finance, and there is now no lack of small informing works for the education of the public—and its rulers. Certainly, the criticism of the Government for its continuous failure to rise to the occasion by proper taxation would satisfy even the *Economist*. High taxation should not have been "postponed until the habit "of lavish spending had become fixed."

But it is for the Capital Levy that Mr. Allen reserves his heaviest batteries. He makes great play—and often justly—with the super-tax statistics as evidence of the fact that the rich people were not better off through the war; but he practically ignores the fact that a new set of rich have arisen through the war, and taken the places of many who have, if not fallen from the ranks, at any rate been reduced in circumstances. And further, he does not deal with the very great extent to which the recapitalisation or "bonus "share" method of getting profits into the hands of shareholders, without attracting liability to taxation, has extended during the war. Many of his contentions under this head are quite sound, but his criticism of Professor Pigou and Mr. Pethick Lawrence is rather shallow, as when he alleges that they "support the view that war "increases the national wealth," for he uses wealth in a real sense, whereas in the passages he quotes, both those writers are considering the amount of "nominal" wealth that would come under a levy. An allegation that an economist of Professor Pigou's calibre is teaching that war, in breeding war loans, is "creating wealth," is so absurd that it recoils upon the writer, and leaves the economist unscathed.

Working upon super-tax data, Mr. Allen claims that the real net income after payment of tax, and adjustment for price, dropped from 207,500,000*l.* in 1914–15 to 119,000,000*l.* in 1916–17, and 131,000,000*l.* in 1917–18. His work is a useful addition to the literature upon the levy, and has points which have not been properly stressed elsewhere. He proposes to balance his post-war Budget of 750,000,000*l.* without any substitute for the excess profits tax by a reformed income-tax, starting at incomes of 75*l.* per annum, at the rate of 4*s.* up to 500*l.*, 6*s.* to 1,000*l.*, with a super-tax rising to a total charge of 12*s.* 6*d.* on all incomes over 100,000*l.*, the 75*l.* abatement applying to all with 25*l.* for each dependent, and 50*l.* extra to the married men. This scale he considers would raise 480,000,000*l.* on a national income of 3,200,000,000*l.* The weak point in the scheme is the political possibility of getting 10*l.* per head on the average directly out of the incomes falling between 75*l.* and 200*l.*, and 50*l.* per head out of the incomes from 200*l.* to 500*l.* Has Mr. Allen heard of the Labour programme on income-tax? Or of the South Wales miner? J.C.S.

5.—*Gold, Prices, and the Witwatersrand.* By R. A. Lehfeldt, D.Sc. 130 pp., 8vo. London: P. S. King and Son, **Ltd.**, 1919. Price 5*s.*

Dr. Lehfeldt has discussed, in short compass, the relation between prices and the stock of gold used for monetary purposes, and has drawn conclusions respecting the best policy to be pursued in the future by the South African mineowners.

A survey, very brief and very broad, is given of the course of prices during the last 100 years, and estimates are quoted of the supply and stock of gold in the world, exclusive, for special reasons, of India and China. An interesting attempt is made to estimate, not only the actual variation in the amount of gold available for monetary purposes, but the amount of gold required to meet the growing needs of commerce and industry, at (presumably) a constant level of prices. On the one hand, Dr. Lehfeldt finds that the population of the (greater part of) the world has increased in recent years at an average annual rate of between 1½ and 2 per cent., and he suggests that this marks the lowest rate at which the world's wealth must be increasing. On the other hand, he quotes an estimate by Professor Irving Fisher to the effect that the trade of the United States has increased at an average rate of 4·9 per cent. per year. This is regarded as an upper limit to the world's "rate "of progress." (By this term must be understood the growth in the output of exchangeable goods). Again, the production of certain commodities of universal consumption, namely, meat, corn, tea, coffee, sugar, wool, cotton, pig iron and coal, is examined, and the rate of increase found to vary from 1 per cent. per year in the case of meat, to 5 per cent. in the case of sugar. On the basis of these data, and allowing for the growing efficiency of substitutes for gold as currency, Dr. Lehfeldt concludes that the world's need for gold (as distinct from the actual supply) has expanded at an average annual rate of about 2½ per cent. A diagram (on page 35), showing the general course of prices, and the ratio of the actual to the "ideal" stock of (monetary) gold, reveals a close correspondence between the two curves, but there is sufficient divergence from the theory to indicate disturbing influences, one of which is said to have been the use of silver as the basis for currency in the middle of last century. (There is a misdescription on p. 35, "full curve" and "dotted curve" having been transposed.)

The problem of gold and prices is, however, not completely envisaged until the whole stock of money (gold, token coins, paper, &c.), and the rapidity of circulation, are brought into view. Dr. Lehfeldt estimates that, before the war, money of all kinds bore a fairly constant ratio, or a very slowly changing ratio, to the stock of gold on which it was based, the ratio being about 2½ or 3 to 1, although the "currency factor," as this ratio is described, varies from country to country, rising in some, and falling in others. As regards the "velocity of circulation," the author is inclined to think that it is increasing.

On the whole discussion Dr. Lehfeldt concludes that "the quan-"tity theory of money, as it would be if there were no money but "gold, is but slightly modified by the circumstances of the modern "commercial world" (p. 64).

This conclusion, however, has reference to pre-war conditions. The war has led to the depreciation of gold, owing partly to the general scarcity and the difficulty of production and distribution of other commodities, and partly to the inflation of currency. Currencies are no longer on a gold basis.

At this point Dr. Lehfeldt turns to the subject of gold production in South Africa, and argues that if the value of gold is to be raised its production must be restricted. "The guide to policy should "be maintenance of the level of prices" (p. 105), and the South African Government, which controls the mining rights of a large part of the East Rand goldfields, can help to secure this by conserving the gold supplies.

There is much to be said for regulating the output of gold, but in any case the supply of currency other than gold is likely to remain considerably greater than before the war—the larger incomes of the "working classes" will be one factor that will ensure this—and the stock of gold may consequently play a weaker part than heretofore in the determination of prices.

The book contains a series of appendices, giving statistics used to support Dr. Lehfeldt's arguments. There is also a number of diagrams, which, unfortunately, are not so completely self-explanatory as they might have been. But this is a slight blemish in a useful book. A.D.W.

6.—*The Trust Problem.* By J. W. Jenks, Ph.D., LL.D. Revised edition. xvii + 199 pp., 8vo. London and New York: G. P. Putnam's Sons, 1917. Price 10*s.* 0*d.* net.

All students of the trust movement are familiar with their "Jenks," but they will find that this fourth edition is, as the author says, "practically a new book." All the old material is there, but important additions have been made. "Some new chapters "have been added. Chapter I on the Evolution of Business, the "very large additions made to Chapter IX on Prices, Chapter X on "Trusts and the Working Man, with the new facts that they contain, "aid materially in the discussion of the economic principles involved. "Chapter XII on Industrial Combinations in Europe gives us a "basis of wide experience. The new chapters on State and Federal "Legislation in the United States, and the one on Trusts and the "Federal Court, showing the development of legislation during the "last few years, likewise serve to strengthen the economic founda-"tion of the discussions, since the course of legislation has, to a "considerable degree, clearly been based upon the principles brought "out in the theoretical discussions." Two-fifths of the book consist of Appendices. Appendix A gives Judge Howe's suggested solutions of the Trust Problem formulated at the Chicago Conference on Trusts in 1899, "a noteworthy document," says Dr. Jenks, "presenting "what were in effect the opinions which could be agreed upon as "long ago as 1900 by substantially all the membership of that great "conference, representing so many conflicting views and interests. "Time has vindicated their judgments." Appendix B reproduces the Final Report of the Industrial Commission of 1902, and Appendix C the proposed New York Business Companies Act (1900), of which more later. In Appendix D are given outline histories of representative trusts, while Appendix E deals with the State Anti-Trust Laws of Texas and New Jersey and Appendix F with Federal Trust Legislation. Appendix G summarises foreign legislation on industrial combinations, and Appendix H suggests selected reading references on Trusts.

This is not the place to discuss fully the problems of industrial combination, but we may observe that the keynote of the author's treatment of the subject is given in his new first chapter, where he shows the great concentration of business in the United States since 1850. "In thirteen leading lines of industry in the United

"States, the average manufacturing plant, in the sixty years from "1850 to 1910, multiplied its capital by more than thirty-nine, "its number of wage-earners by nearly seven, and the value of its "output by more than nineteen." He asks us further "to note "the culminating preponderance of the large plant in the whole "range of present manufacturing in the United States," and declares that "these same facts suggest that the Trust movement is but a "recent stage of this century-old tendency to increase the size of "manufacturing units, and that the Trust is therefore a normal "product of the industrial evolution consequent upon the use of "power-driven machinery."

The public will, however, judge a Trust not by its normality, but by its effects on the consumer and the worker. Turning then to the largely increased Chapter IX on Prices we find that: "An "industrial combination controlling so large a percentage of the "entire output that consumers are compelled to buy at least a "considerable portion of the supply from the combination is able "for a time to affect materially prices in the market." His conclusion is: "Contrary to public opinion, a careful study of the charts "indicates that the effect of these combinations, taking their history "as a whole, has not been to increase prices to the consumers "though at certain times for relatively short periods they have "doubtless increased prices." With regard to the Trust and its employees Dr. Jenks has discovered no special hostility towards trade unions; the reduction in superintendents and travelling men does not affect the ordinary employer. "The experience so far "would seem to show that labour has been made more efficient by "combinations of capital; that, owing to the better organisation, "there is a larger average output per workman; and that the "benefits of this increased efficiency for a time at least have been "placed between employers and workmen. . . . Speaking gene"rally, at any rate, no damage to the labourers as a class seems to "have resulted, either in the way of decreased wages . . . . or in "the way of less steadiness of employment."

In dealing with prices Dr. Jenks compares the prices of raw materials and finished products over a period, the margin showing the cost of manufacture plus the profit. For such cases as pig-iron and steel or cotton yarn and piece goods this method is effective, but, as he himself points out, its value is affected by the importance of by-products. In some cases this is a matter of considerable seriousness. For example, no valuable result would be obtained by comparing the prices of cattle with those of beef. The only reliable comparison would be to take from time to time the cost of a lot of, say, a hundred steers and set against it the total amount received not only for the beef, but for the hides, tallow, oleo, and the thousand and one by-products of a packing-house; only in this way can the true margin and its movement be ascertained. "Perhaps," he says, "the most accurate way to estimate the influence of any industrial "combination upon prices, especially if the combination to a con-

"siderable extent leads the market, is to examine the purchasing "power of a unit of that commodity in terms of general commodities . . . By dividing the index number by the relative "price of sugar we obtain in general terms the amount of commodities that can be bought by a unit of sugar." By this method he comes to the conclusion "that the purchasing power of a unit of "steel or of sugar or of refined petroleum has, on the whole, decreased "during this period of rising prices" (the last few years).

The New York Business Companies Bill of 1900, of which Dr. Jenks was largely the author, permitted mergers, but set up stringent standards of publicity and audit. Legislation on combinations in the United States has proceeded on the basis of hostility to monopoly. The Sherman Anti-Trust Act of 1890 prohibited broadly "every "contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce among the several "States, or with foreign nations," and it was not till twenty-four years later that labour was specifically exempted from its purview. This general prohibition stood until 1911, when the oil and tobacco cases "made the ruling which distinguished between reasonable "and unreasonable restraints of trade." The "standard of reason" has, however, received a severe shock from the Clayton Anti-Trust Act of 1914, under which, *inter alia*, commercial corporations are forbidden to acquire the whole or part of the stock of another corporation "where the effect may be to substantially lessen competition between the corporation whose stock is so acquired and the "corporation making the acquisition." This makes any merger, big or little, impossible, and Dr. Jenks drily remarks: "It will be "interesting to observe once more the penetrability of an impenetrable legislative wall if the evolutionary strength of the combination movement in the United States is not yet spent."

Dr. Jenks says in his Introduction: "This study is not intended "primarily for the student of economic theory. As a brief impartial "statement of facts and principles, it is hoped that it will prove "useful to the many busy men who have not the leisure to gather "the material, but who, wishing to do their duty as citizens intelligently, will welcome a brief compendium which may to a "certain degree serve them as a basis for judgment. And yet it is "thought that the studies connected herewith will be useful to "students. They seem to have marked some brief steps in economic "theory and practice." It is a modest claim and may readily and gratefully be granted. H.W.M.

7.—*Effects of the War upon Insurance: With Special Reference to the Substitution of Insurance for Pensions.* By William F. Gephart, Professor of Economics, Washington University, St. Louis. 302 pp., 8vo. New York: Oxford University Press, 1918. Price 4*s*. 6*d*.

This work is Number 6 of the preliminary studies of the war prepared under the direction of the division of economics and history of the Carnegie Endowment for International Peace.

Professor Kinley, of the University of Illinois, the editor of the series, thinks that Professor Gephart's "study shows that while "there is a more widespread belief than ever before in the propriety "of what is commonly called social insurance, not only in the field "of life, but of other insurance, there is no evidence that after the "war the services of private insurance companies will be dispensed "with or their field of activity seriously limited by government "participation in insurance." The author himself is of opinion that "civilised society in all the leading nations seems to be on the "eve of a wide extension and application of the insurance principle." A useful portion of his work is a digest of the legal decisions in America and in England on the status of war insurance contracts.

Professor Gephart furnishes a great body of interesting statistics on his subject. From one of his numerous Tables it appears that the amount of life insurance in force at the close of the year 1916 per head of the population was

	£		£
In the United States	61	In Germany	7
In Canada....	47	In France	4
In Great Britain	25	In Japan	1

The effect of the war upon life insurance is studied in much detail.

With regard to social insurance, he points out the ambiguity of the phrase. In many respects all forms of insurance are social, and the expression is not used in the same sense by students in different countries. He concludes that the war has had a tendency to stop for a time the normal scientific development of social insurance for wage earners, but that the employment of women has rendered necessary its extension to them, that the war has caused an increase of pensions in amount and application, and that on the whole the net result of the war is likely to be an extension of social insurance.

Instructive and well-informed chapters on marine and fire insurance are added. The book comprehends a valuable collection of facts, illuminated by sound reasoning. E. B.

8.—*Australian Social Development.* Studies in History, Economic and Public. Edited by the Faculty of Political Science of Columbia University. Vol. 81, No. 2. 300 pp., 8vo. 1918. By Clarence H. Northcott, Ph.D. Price 10s. net.

The economic and social development of Australia in the last thirty years is a subject of great fascination, and Dr. Northcott has evidently approached it not only with scientific but with sympathetic interest. In spite of the vast extent, natural resources, and comparatively scanty population of the continent, Australia had in the nineteenth century begun to reproduce many of the problems characteristic of older countries. Land was becoming concentrated in the hands of a few, the population aggregated in towns, and certain industries were run on cheap, even in some cases disastrously cheap, labour. It is here that the special interest of

Australia's history begins. It was left to two or three of these small states, remote from the most important centres of European and American life, to make the most determined and systematic effort on record to prevent the sweating and oppression of the poorer class of manual workers, to improve their standard of life, and to build up an effective civic conscience, based on a social ideal more exacting than had yet been recognised in any individual state. Wages have been deliberately made the first charge on industry. Education has been provided for every child. The social care for health, comprising measures for infant welfare, the care of expectant and nursing mothers, hygienic conditions in factories, &c., has been carried further than elsewhere. Land monopoly has been checked and facilities given to open large estates for settlement. Labour stands for giving Australians the opportunity to become healthy citizens with healthy families, and an enlightened people. Women enjoy political equality and are protected by drastic laws against economic exploitation.

In some other respects the economic position is less encouraging. The geographical extent and climatic difficulties of the country point to the necessity for a higher development of scientific knowledge and for statesmanship of a wider outlook and more expert equipment than has yet been attained—needs which, however, are not peculiar to the Antipodes. Another difficulty, also, is familiar enough here, viz., the problem of providing for a future supply of skilled labour, which neither employers nor trade unions have yet been able to solve satisfactorily. Boys flock into the unskilled occupations which offer the conditions most immediately attractive, and like other countries, Australia is in this respect, "living on her "capital."

Higher productivity of industry is acutely needed, and is hindered not only by industrial strife but by incompetent management. More science, more training, more education, are all required to promote a better conservation of national resources (p. 280). A prime need, in Dr. Northcott's view, is for such a measure of democratic control in industry as will overcome industrial strife and secure to the workers "an effective interest in the success" of their trade or industry (p. 282–3). Modern industry, still so autocratic in its methods, has hitherto failed to secure the social co-operation it requires. B.L.H.

9.—*The Silk Industry and Trade.* By Ratan C. Rawlley, M.A., M.Sc. (Econ.), Carnegie Research Fellow. 172 + xvi pp., 8vo. London: P. S. King and Son, Ltd., 1919. Price 12*s.* 6*d.*

In this very excellent study a successful endeavour has been made to discover the exact requirements of the silk markets of Great Britain and France and to present a general analysis of the organisation of the export trade in Kashmir and Indian silks. Mr. Rawlley divides his subject into three main divisions, and devotes the first portion to a detailed account of the British silk industry with a thoroughness which is apparent throughout the investigation. Although there is general carefulness of definition in the book it must be stated that industrialists of Bradford will not be pleased to learn that the major part of their activity is expended on *woollen* manufacture, especially as anyone conversant with the textile industries will know that the great speciality of that district is *worsteds*, which is an entirely different trade. After stating that artificial silk "has ousted real silk in almost every branch of the "British silk industry," Mr. Rawlley goes very fully into the nature and quality of the raw fibre used in this country and also the effect of each quality on the intermediate processes and on the ultimate product. In discussing the defects of raw silk, he enumerates those which influence the quality of the manufactured product, such as lack of evenness due to the neglect of the reelers, and faulty cleaning; those which influence the cost of production, such as in the speed with which silk can be wound or the amount of waste made in throwing; and finally defects which limit the scope of the utility of the silk, such as variations in the colour or nature which are more keenly felt in the British than in the French trade.

Scientific improvements are recommended in various processes of the spinning, and the perfection of the process of carbonisation is suggested. Such questions may very profitably be considered by the British Silk Research Association which has recently been established to make investigations and bring pure and applied science into close union with this industry.

With special reference to India, we learn that a new industrial field will be created if the detailed reforms outlined be adopted. These reforms are too numerous and technical to mention here, but they will amply repay the most careful consideration of both producers and exporters.

The industry in France is more concentrated and deals with the production of raw silk, the reeling of imported cocoons (but this "cannot be said to be flourishing") and the manufacturing branch for which "there is a body of highly skilled labour." "There is a "fine opportunity for Indian waste to find a favourable outlet in the "French market." Mr. Rawlley describes the Conditioning House at Lyons, where reports are made upon the hygrometrical state of given samples, the average loss to be expected in "boiling-off" or degumming, the thickness of the thread, elasticity and tenacity of the silk, winding tests, and the determination of twist in thrown silk; and where a chemical analysis of the fibre may be made in the research laboratory. "A Conditioning House in India would "at least pay its own expenses" and "its commercial and scientific "utility would far exceed the initial outlay."

As regards the price of the raw material the chief influences are said to be in the nature of labour costs, climatic conditions, stock holding, variations in the thoroughness of the cleaning processes (in the case of wastes), and transport charges which sometimes amount to about 20 per cent. of the final delivery price. A very interesting account is given of the commercial organisation of the industry and practical methods of a more scientific system of grading and packing are put forward. As part of a constructive policy Mr. Rawlley recommends the general adoption of "selling on commission" and control of trade by "private enterprise aided by State capital."

A very useful treatise is concluded by a historical sketch of the growth of the Indian silk trade. A.F.

10.—*Railway Re-organization.* By a Railway Officer. 108 + xii pp., 8vo. E. and F. N. Spon, 1919.

It may be only a coincidence that the author values the economies which he suggests as possible in railway working at 49,000,000*l.* per annum at a time, May, 1918, when the official estimate put the increased cost of railway wages at 47,000,000*l.* But if he is consciously endeavouring to balance the railway account he has now to meet an increased expenditure on wages alone of 77,000,000*l.* to 82,000,000*l.*, irrespective of higher costs of material, estimated at 27,000,000*l.* He suffers in common with all students of British railway working from the fact that the latest Board of Trade Railway Returns (Cd. 8038) do not take us beyond 1913, and as that Department in the supposed interests of economy have absolved the railway companies from publishing the annual statistical returns during the last few years it is impossible to gauge the very great economies which have been effected in railway working in that time.

Each of the main railway departments is reviewed, the costs set out and compared with the expenditure which would have been necessary had regard been paid to certain unit costs laid down by the writer as axiomatic. The latter are almost invariably considerably less than the costs of any individual company, as set out in a useful Appendix, and although the author claims that they are based on inside knowledge and experience of every department of the railway service, he can scarcely complain if readers hesitate to accept as possible from an anonymous writer results which have not been achieved by any railway of standing. To illustrate, it is said that 2·5 wages men per engine are more than ample for all possible requirements. The author does not say whether his statement is in respect of each engine in traffic or each engine in stock. It may be taken that from 80 per cent. to 85 per cent. of the total stock of engines are available for traffic at any time, and that of the engines available the total weekly hours of each averages from 50 per cent. to 55 per cent. of the possible 168. Averaged over the whole stock, therefore, the daily hours are 10 per engine or 12 to 13 per engine available, and it is obvious that, with an 8-hour day, a driver and fireman for every engine and some portion of the time of a cleaner it is not possible to reduce the engine man-power to the basis assumed by the writer

It has not been the practice of the Board of Trade when ordering returns of railway employees and wages to issue any detailed instructions for their compilation and there is probably, therefore, no uniformity of practice as between the various railway companies in the method of dealing with, *e.g.*, casuals employed for the whole or part of a week, staff on sick leave or unappointed staff. The work is also not distributed in an uniform manner between salaried and wages employees. This caution has to be observed when comparing the results of various companies, and it is scarcely correct to speak of all salaried staff, including young clerks of 16 years of age, as "salaried officials." The author's intimate railway knowledge should also have prevented him from describing staff included under the heading of "Superintendence" as either public enquiry clerks or supervisory officials. It may well be that the cartage side of railway operations is unremunerative, but to speak of it being obviously so proves nothing. The expenses of collection and delivery are normally published each year, but the receipts are not, and in the absence of these it is impossible to speak with confidence on the subject.

The above are a few of the many criticisms which will occur to a reader versed in railway working, but the book nevertheless serves a useful purpose. In the light of what has been done since 1913 with staff and equipment smaller in number and less efficient than before the war it would be idle to assert that 1913 represented the high-water mark of railway achievement. Still better results can doubtless be attained and if, on the examination of possibly mistaken criticisms, points of improvement are suggested to the responsible officials, the critic has not failed in his purpose.] W.H.J.

11.—*Life of Viscount Rhondda.* By J. Vyrnwy Morgan, D.D. 255 pp., 8vo. London: H. R. Allenson, 1919.

The subject of this biography stood out from his fellows. His business capacity was remarkable, and he amassed thereby large wealth. But the gratifying sense of ultimate triumph over stubborn obstacles, and the successful exertion of power, of the possession of which he was properly conscious, were more tempting motives to engage in the varied undertakings on a grand scale in which he played a leading part than the accumulation of riches. In his political ambitions he was frankly disappointed because he did not obtain, in the offer of high office which he had expected, the recognition he thought that he deserved; and we should remember that the position he had gained, and for long held, in Wales at Parliamentary elections was next, if it was even below, that occupied in the esteem of his countrymen by the present Prime Minister. A leading figure among colliery proprietors, and frank and forcible in the expression of his view of the deep continuing obligation of labour to capitalistic enterprise, he received the hearty support of mining constituencies by majorities larger rather than smaller than those obtained by trade unionist officials. His intimate knowledge of the coal trade, as his position therein, rivalled that of Lord Merthyr. D. A. Thomas, as he originally was, ranked very high in such circles; and the paper read on the position and prospects of that industry before the Royal Statistical Society attracted at the time great notice and has since received the deserved tribute of frequent consultation as authoritative.

At the close of an active life he rendered most useful notable service to his country by his marked success in the most difficult perhaps of all offices—that of Food Controller—and it is literally true that he surrendered his life in the courageous discharge of an unpopular but necessary task as whole-heartedly as any soldier on land or sailor on the sea. He had thus indeed his appropriate revenge on the Kaiser for the sinking of the "Lusitania" by which he had nearly perished; for before his death he had by his foresight and his firmness secured the important and surprising result that compulsory rationing should work more smoothly and effectively with liberty-loving Britons than it did with drilled, disciplined, submissive Germans. He knew from his medical advisers that he was practically doomed when he accepted the exchange of such arduous and ungrateful effort for the congenial work on which he was previously engaged at the Local Government Board.

Dr. Morgan, recognising the obvious defects, pays a fitting tribute to the great qualities, of Lord Rhondda; and he shows instructively that his masterliness, and his confidence in his opinion, which, once formed, could not be shaken by any opposition, contributed to the achievement of his final work, if they did not appear to be very amiable or endearing in his earlier career. The biography is commendably short and is appropriately divided, and it is duly appreciative without failing to discriminate. But it nevertheless errs by discursiveness, if not by irrelevancy; and the strict subject is too often used as an excuse for the intrusion, and disproportionate statement, of the author's own views on some topics of more general interest, suggested by rather than connected with the personal characteristics of Lord Rhondda or the actual details of his conduct and experience. Within the small compass of 255 pages our patience is tried by Dr. Morgan's disquisitions, if we acknowledge that his picture as a whole gives the impression of an accurate and living portrait. For that we are thankful and we feel that Lord Rhondda was indisputably an outstanding man.

L.L.P.

12.—*The Industrial Decline in India.* By Balkrishna, M.A. 408 pp., 8vo. Star Press. Allahabad, 1917.

The universal and overwhelming predominance of agriculture in the economy of India has long occupied the serious attention of the Administration, and it is recognized that no question is of greater moment, from the social and political, as well as from the economic, standpoint, than how to divert the weight of a growing population from cultivation to the local exploitation of the other vast natural resources of the country. The general conditions of the problem, with the measures suggested by the recent Commission on Indian industries, were admirably summarized in a paper read a few months ago, before the Royal Society of Arts, by Mr. Chadwick. The Work under review, which opens genially with "The "war has abruptly disillusioned England of the long-cherished "notion of her inherent naval strength and economic supremacy," contributes nothing to the discussion but what has long been commonplace in certain circles. It contains most of the stock quotations worn threadbare during the last half-century in attacks upon the maladministration of India, and duly sets forth the Census figures bearing upon occupation, though not usually quoting the compilers' qualifications as to their comparability or the general review which places them in their due proportion, a process which often indicates conclusions very different from those drawn by the author. Nor is his case strengthened by the use of exaggerated language, or by attributing to an "invertebrate British rule the "deliberate murder" of indigenous industries, a form of literature more usually found in the recent Indian propaganda in the United States. His remedy is Protection against British and foreign competition, and (on the last page) Education. J.A.B.

13.—*Other New Publications.**

Brazil. What Brazil Buys and Sells. xxix + 101 pp., 4to. Rio de Janeiro, 1918. Imprensa Nacional.

[These particulars have been compiled by the Brazilian Ministry of Agriculture, Industry and Commerce, for circulation in the United States, with a view to bringing before the American public important facts concerning the foreign trade of Brazil before and since the war, and to show the possibilities of further developments of American trade in Brazil.]

British Dominions Year Book, 1919. Edited by Edward Salmon, F.R.C.I., and James Worsfold, F.C.I.S. 288 pp., 8vo. Published by the Eagle, Star and British Dominions Insurance Company, Ltd. Price 1*s*.

[Among the special articles are:—"The Air Work of the Year," by C. G. Grey (one of three on the Fourth Year of the War); "The Food Problem," by the Right Hon. J. R. Clynes, M.P.; "The Work of the Ministry of Food," by M. H. Temple; "The Sphere of the Chemist," and "Oil, an Imperial Problem," by Prof. J. S. S. Brame; "The Truth about Japan," by Edwin Oliver; "India," by Sir M. M. Bhownaggree, K.C.I.E.; "The Army Medical Science," by "Whitehall"; "The Development of Inter-Imperial Communication," by Charles Bright. The articles embody statistical information, and the book includes summaries of figures relating to the year's trade returns, coal output, incomes, vital statistics, etc., lists of members of the Government, of the year's V.C.s, and other useful information. The volume has an index, and is illustrated with maps, graphs and photographs.]

Business Prospects Year Book, 1919. Edited by C. P. Hailey and D. Willson Lloyd. 262 pp., 8vo. Cardiff: The Business Statistics Company, Ltd. Price 10*s*. net.

[The contents are summarised on the title page as "What will Happen to Coal, Iron, Copper, Tin, Tinplates, Spelter, Oil, Shipping, Money Markets, Wheat, Cotton, Rubber," and consist of a series of articles ranging in length from about five to twenty-six pages, reviewing the position, recent history, and prospects in each trade or industry, with statistics of products, price, export and import, consumption, etc. The comparative tables in most cases include the figures (or else estimates) for 1918.]

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* See also "Additions to the Library," page 435, *sqq.*

Carnegie Endowment for International Peace. Preliminary Economic Studies of the War. Edited by David Kinley. The Financial History of Great Britain, 1914–18, by Frank L. McVey. 101 pp., 8vo. New York: Oxford University Press, 1918. Price 4s. 6*d.* net.

[One of the Preliminary Economic Studies of the War issued by the Division of Economics and History of the Carnegie Endowment for International Peace. The series is edited by Professor Kinley, of the University of Illinois, who contributes a preface in which the financial strength of Great Britain, the sound sense, on the whole, of her financial policy, and the patriotism of her people are commended to the notice of his own nation. The book itself is a straightforward and clearly-written account of our war finance, including the emergency measures taken at the beginning of the war for saving the commercial situation and regulating exchanges. The information is supplemented by comments published at the time, many being taken from the pages of the "Economist." The plan of the book is clearly shown in the synopsis of the contents (p. 5), which divides the subject-matter into: I. Emergency Legislation; II. Public Finance Problems; III. Some Financial Effects of the War. Under (I) the author describes in turn the moratorium, currency and bank notes, the Stock Exchange situation, Courts Emergency Act, and Shipping Insurance; under (II) the means adopted by successive Chancellors for financing the war, with a rather full account of the Dollar Securities Scheme and details of war taxation; while (III), the most general section, treats briefly of prices and inflation, organization and accounting, trade and Government policy, and includes a short discussion of the report of the Committee on War Expenditure and a glance at the after-war problems of finance. The author plainly states his preference for the idea of a higher income tax rather than that of a capital levy. It is perhaps a pity that the chapter headings and subdivisions do not correspond systematically with those given in the synopsis.]

Charriaut (*Henri*) and *Hacault* (*R.*). La Liquidation Financière de la Guerre. 96 pp., 8vo. Paris: F. Alcan, 1919. Price 2 francs.

[A brief yet careful survey of the questions involved in the financial settlement of the cost of the war and how they can best be solved. The economic position of Germany is examined, and also what she is capable of paying and how the payments should be made. The allocation of the indemnity among the different claimants is also considered, and a plan is given for the floating of an Inter-Allied loan based on the sums to be obtained from the enemy countries.]

Cox (*Harold*). The Coal Industry: Dangers of Nationalisation, 18 pp., 8vo. London: Longmans, Green and Co., 1919. Price 6*d.* Pamphlet.

[Mr. Harold Cox is constant in presenting difficulties for the consideration of enthusiastic reformers. and, as in his evidence before the Coal Commission, he warns the advocates of nationalisation that the only business now run by the State shows a financial loss, reminds them of the evils of bureaucracy, and looks for the ultimate devouring of Labour by the monster it would create—to an era, in short, of industrial conscription as the final result of State ownership. The fundamental drawback of bureaucratization is noted in the statement that individual motives operate against efficiency in State-managed but for efficiency in privately-managed concerns. Mr. Cox controverts the Fabian calculation, based on the figures of 1913, of the profits which should accrue to the nation as mineowner, but, like most authorities, thinks that considerable saving might be effected by reasoned methods of distribution.]

Decimal Association. Decimal Coinage: The Existing British Coinage Rearranged on the Decimal Basis. 13 pp., 8vo. London, 1919. Industrial Reconstruction and the Metric System, by Harry Allcock. 8 pp., 8vo. London, 1919.

[The arguments for establishing a decimal system in the United Kingdom and for establishing it now are set out in the first of these pamphlets, and the "£-mil" scheme agreed on at the joint conference of the Institute of Bankers, Association of Chambers of Commerce, and the Decimal Association, is tabulated and explained, with suggestions for a plan of transition. The alternative "Dollar" scheme advocated by Lord Leverhulme and others is also described and its defects are indicated. The text of the second pamphlet is that "the necessary expansion of our export trade . . . . . calls for a reconsideration of the international metric system as the universal language of quantity." The broad arguments for the adoption of metric standards are briefly stated, the objections commonly advanced are enumerated and met, and suggestions for Government action are put forward.]

Dougharty (Harold). Notes on Deposit Pension Schemes. 16 pp., 8vo. London: Effingham Wilson, 1919. Price 2*s.* net.

[Intended for the use of "Secretaries, Accountants and others who may be contemplating the formation of a pension scheme for a comparatively small body of employees," this pamphlet deals with "Deposit Schemes," which are in the nature of deferred annuities, in contrast to the "Service Salary Scheme, where . . . . . an endeavour is made to determine a fixed percentage of present and future salaries which will provide a pension of a certain percentage of the final (or average) salary an employee may be expected to receive when he retires." The author considers that the former is the "only safe and sure method." Specimen forms are given for scheduling data, with suggested rules for a Pension Fund, and for the method of keeping records and accounts.]

Economic Trends of War and Reconstruction, 1860–70. 30 pp., 8vo. New York: Brookmire Economic Service, 1918. Price $5.

[In view of the end of the war and what will happen after, people in the United States are looking back to what happened after the great American Civil War and how the American nation readjusted itself. The object of this book is to give in a convenient form a statistical picture of the Civil War and of its reconstruction period, with as much detail as it is possible to compile with reasonable accuracy from the data collected and published during those years. The compilation is timely and of much value.]

Heyking (Baron A.). I. Bolshevism and Pusillanimity. II. The Baltic Problem. 46 pp., 8vo. London: P. S. King and Son, 1919. Price 1*s.*

[This pamphlet is an amplification of a chapter in Baron Heyking's "Problems Confronting Russia." The argument of Part I is sufficiently indicated by its title. Part II is an interesting and able sketch of the history and the present state of the Baltic Provinces. Baron Heyking advocates a policy of "freedom, tolerance and local autonomy" for the three Baltic peoples, and bases his confidence in the result on their willingness to co-operate and even coalesce with one another, and on the fact that "those of Teutonic descent stand for order and organisation, the Letts for adaptability and endeavour, and the Esths for industry and perseverance." He mentions that the proportion of illiterates in these provinces is smaller than in any other part of Russia.]

Kelly (*Caleb G.*). French Protestantism, 1559–1562. John Hopkins' University Studies. Series XXXV., No. 1, 8vo. Baltimore. 1918. Price $1 25 c.

[A study of French Protestantism during the above period and its development, more especially through the operation of social and economic forces, and particularly among the industrial and working classes. The author finds that this phase of its history has not been studied adequately hitherto, and submits his book as a modest introduction to an important subject.]

National Bank of South Africa, Ltd. Income Tax, Weights and Measures, Stamp Duties. Coinage, British, Colonial and Foreign. 325 pp., 8vo. 1918.

[This useful handbook includes all civilised countries in its scope. The first part consists of detailed tables of current income-tax and profits tax, and includes the British rates of the last ten years, and also comparative tables showing the tax payable on earned and unearned incomes from £250 to £20,000 in Great Britain and the Dominions. The section dealing with coinage is fully illustrated with photographs.]

The People's Year Book and Annual of the English and Scottish Wholesale Societies, 1919. Second year of publication. 381 pp., 8vo. Manchester, 1919.

[For the first time since 1880, the well-known annual of the C.W.S. has been dropped in its usual form and combined with this issue of the People's Year Book. It is intended to continue this practice, and to produce yearly a volume essential to all who desire to be acquainted with the various social, economic and industrial activities of present-day democracy.]

Robertson (*W. A.*) and *Fisher* (*Alan*). Odd Time Tables. 80 pp., 8vo. Edinburgh: Oliver and Boyd, 1919. Price 8*s.* 6*d.*

[For the economical calculation of short periods on annual payments, more particularly "odd times," re-insurance and guarantee "considerations," and "returns."]

Ross (*C. Edmonstone*). Period Computation. 11 pp., 8vo. London: Watts and Co., 1919. Price 1*s.*

[The title page states this to be "A simple ready reckoner for rapidly calculating (1) the number of weeks and days between any dates, whether in the same or different years; (2) the maturity date of any bill; (3) the day of the week of any date in the twentieth century—without using calendars or tabulated results. The system is one of key numbers, which can easily be remembered, arranged according to simple formulæ, which should be as readily grasped by the ordinary person.]

Roumania. Some Details regarding its History, Growth, System of Government, Financial Resources, etc. 15 pp., 8vo. Issued by the Bank of Roumania, Ltd., London.

[This pamphlet gives a short and useful record of the origin of Roumania, its financial position, commerce and shipping, means of communication, and its principal industries.]

Scott (*James Brown*). James Madison's Notes of Debates in the Federal Convention of 1787, and their relation to a more perfect Society of Nations. 149 pp., 8vo. New York: Oxford University Press, 1918. Price 10*s.* 6*d.*

[This book, contrary to the expectation raised by its title, does not consist of the Notes themselves, but gives an account of the Federal Convention and its task—of its origin, proceedings and achievements—with a number of quotations from the debates and some explanation

Scott (*James Brown*). James Madison's Notes of Debates—*Contd.*
of the special difficulties involved in the union of the sovereign states of North America. The author is of opinion that the Convention "was in fact as well as in form an international Conference" (though this is perhaps to ignore the distinction between lines of racial and those of chiefly geographical or administrative cleavage), and the motive of this publication lies in his conviction that an exact knowledge of the process by which the Union was accomplished should prove of great value in any future efforts towards a federation or union of separate peoples. In his preface—the date of which is, appropriately, that of the Armistice—Professor Scott states that an edition of Madison's notes will shortly be forthcoming.]

South Wales Coal Annual, 1919. Vol. 16. xxxi + 402 pp., 8vo. Cardiff: Business Statistics Company, 1919. Price 12*s.* 6*d.* net.
[The present issue of this useful book of reference gives the latest available figures of production, exports and freights of coal. Railway rates for conveyance of coal, statistics of wages, and the terms of wages agreements are also included.]

Springer (*Leopold*). Some Aspects of Financial and Commercial After-War Conditions. 118 pp., 8vo. London: P. S. King and Son, 1918.
[These "reflections of a student of finance on the prospective position" are a series of brief chapters written around the "unwritten economic "law," which proclaims the inevitability of a world-wide financial and commercial crisis. The author combats the view that any such collapse is probable, and deals with the several lines of suggestion, viz., the reduced purchasing power of devastated regions, the difficulty in financing trade, the additional taxation, the favourable position of neutral competitors. His treatment, though too slight to be convincing, nevertheless contains many shrewd observations. The proposal for organized State-supported central credit institutions to enable business whose funds are depleted by taxation to expand satisfactorily, is interesting. Mr. Springer suggests that 300 millions sterling in gold has been displaced, and that it will support 550 millions of additional currency, or 1,000 millions of extra trade, for which he deducts 250 millions reduced trade in the regions dispossessed of that gold.]

Story (*Russell M.*). The American Municipal Executive (University of Illinois Studies in the Social Sciences, Vol. VII, No 3, 1918). 231 pp., 8vo. Urbana, Illinois, 1918. Price $1 25 c.
[A careful survey of American municipal government from its inception in colonial times to the present day. The relations of the mayor with the city council and their respective powers in regard to administration and legislation are fully set forth. It is further shown how the increasing activities of modern municipal government have led to the reduction of municipal councils to a condition of dependence upon the executive; this is the outstanding fact of modern American city government.]

The Traffic Field. xv + 299 pp., 8vo. Chicago: La Salle Extension University, 1919.
[This book is composed of several papers on subjects dealing with railway and industrial traffic and transport, brought together with a view to forming a manual on the subject for those interested. The different authors are all men skilled in several phases of railway management or control.]

Zorn (*John*). Thoughts on a Capital Levy. (Read before a meeting of the Political and Economic Circle of the National Liberal Club, February 12th, 1919). 14 pp., 8vo.
[The principle of a levy on assets—a term which the author prefers to "capital," as bearing a more definite connotation—is herein implicitly

Zorn (John). Thoughts on a Capital Levy—*Contd.*

approved; but with a warning that the success of such a measure must "largely depend on the species of the citizen's assets on which the "levy is made." The taxation of active or working capital results in a net diminution of the national wealth, while a levy on the reserve wealth, or passive capital, properly applied, should bring about a redistribution and not an actual loss of wealth. A distinction is likewise drawn between parasitic and wealth-creating capitalists (though the dividing line is not always between man and man, for the same individual might be classed differently according as one or another portion of his wealth came under consideration), and the author holds that "true national "economy dictates the levying of the lightest possible burden of taxation "on the wealth-creators of the nation, but that the taxation of idle "capital and idle capitalists neither discourages thrift nor burdens "a nation." The climax of the argument is a plea for the "correct and "scientific use of . . . . . Government credit" in dealing with the problems of financing the war debt and the expenditure necessary for reconstruction.]

CURRENT NOTES.

In comparison with March the Board of Trade Returns record substantial increases in the values of the imports and exports during April. The imports were greater in value by 6,438,000*l.*, the exports of the United Kingdom produce by 5,374,000*l.*, and the re-exports by 4,397,000*l.* On the import side the principal increases were in grain and flour, meat, cotton and wool, decreases being shown in the values for oil seeds, oils, metal manufactures and leather and manufactures thereof. On the export side the principal differences were a decrease of 2,066,000*l.* in the value of coal, and an increase of 3,727,000*l.* in that of cotton yarns and fabrics. The shipments of bacon and condensed milk to Germany and the Netherlands, and of textile materials and flaxseed, contributed to the important increase in the value of the re-exports. The values for the four months ended April 30, 1919, compared with the five months a year earlier, show an increase of 34,089,000*l.* in the imports; of 49,009,000*l.* in the exports of domestic produce, and of 20,712,000*l.* in the re-exports. Food and drink and tobacco accounted for 29,281,000*l.* of the increased imports (although the value of grain and flour was less by 11,568,000*l.*), and raw materials and articles mainly unmanufactured for 13,178,000*l.*, cotton being less by 7,258,000*l.*, wool more by 8,184,000*l.*, flaxseed more by 4,077,000*l.*, and rubber more by 3,463,000*l.* The value of the imports in the four months of articles wholly or mainly manufactured was less by 7,330,000*l.* than in the four months of 1918. Of the larger value of the exports of domestic produce, coal accounted for 7,091,000*l.*, iron and steel and manufactures thereof for 5,073,000*l.*, cotton yarns and fabrics for 9,672,000*l.*, and woollen yarns and fabrics for 10,334,000*l.*

The *Board of Trade Journal* gives the following estimated weights of the articles of all classes imported in the four months, with their values:—

Four months ended April 30.	Estimated weight.	Value.
	Tons.	£
1919	10,300,000	459,027,119
1918	11,150,000	424,938,373
1903	16,200,000	259,197,623

In the following table the usual comparison is made of the aggregate values of trade in the principal classes for complete periods of twelve months. The particulars for the period ended April 30, 1918, are exclusive of the values of certain imports and exports on Government account in May and June of 1917, and it may be noted that during the corresponding months of the following year such Government imports were valued at 33,079,000*l.*, over two-thirds of which were for manufactured articles and the remaining amount mostly for raw materials. Such Government exports in the two months of 1918 were valued at 5,136,000*l.*, of which 4,400,000*l.* was on account of goods manufactured in the United Kingdom.

	Twelve months ending April, 1919.	Twelve months ending April, 1918.	Increase (+) or Decrease (−).
Imports, value c.i.f.—	£'000.	£'000.	£'000.
I. Food, drink and tobacco	601,940,	476,424,	+ 125,516,
II. Raw materials and articles mainly unmanufactured	472,037,	421,990,	+ 50,047,
III. Articles wholly or mainly manufactured.....	272,834,	256,718,	+ 16,116,
IV. Miscellaneous and unclassified (including parcel post)	6,616,	6,949,	− 333,
Total merchandise....................	1,353.427,	1,162,081,	+ 191,346,
Exports of produce and manufactures of the United Kingdom, value, f.o.b.—			
I. Food, drink and tobacco	15,366,	13,354,	+ 2,012,
II. Raw materials and articles mainly unmanufactured	68,274,	65,397,	+ 2,877,
III Articles wholly or mainly manufactured...........................	444,695,	421,847,	+ 22,848,
IV. Miscellaneous and unclassified (including parcel post)	19,147,	19.262,	− 115,
Exports of foreign and colonial merchandise, value f.o.b.—			
I. Food, drink and tobacco	14,201,	4,765	+ 9,436,
II. Raw materials and articles mainly unmanufactured	22,784,	26,982,	− 4,198,
III. Articles wholly or mainly manufactured...........................	14,671,	15,656,	− 985,
IV. Miscellaneous and unclassified	13,	56,	− 43,
Total British, foreign and colonial	599.151,	567,319,	+ 31,832,

In continuation of statistics relating to employment within the United Kingdom, quoted on p. 257 of the March JOURNAL, further returns from Trade Unions with a net membership of 1,203,000 showed 2·9 per cent. of their members unemployed at the end of March, and 2·8 per cent. at the end of April, as compared with 0·9 per cent. a year before. Owing to the absence of information as to the total numbers insured on dates subsequent to January, and owing to a new classification of workers, the statistics relating to unemployment among persons insured under the Acts of 1911 and 1916 are no longer comparable with those previously quoted from the *Labour Gazette*. These considerations apply particularly to statistics of women workers. On the basis of the numbers insured in January, the unemployment percentages for men and boys were at the end of March 9·99 under the 1911 Act, and 4·57 under the 1916 Act, while at the end of April the corresponding rates were 9·90 and 4·77. More detailed information is available in the statistics published by the *Labour Gazette* relating to the payment of out-of-work donations. The following table is in continuation of that given on p. 258 of the March JOURNAL :—

Date.	Men.	Boys.	Women and girls.	Demobilized members of H.M. Forces.	Civilians.	Grand total of policies remaining lodged.
February 28	393,265	28,019	527,336	166,257	782,363	948,620
March 28	514,737	26,461	519,047	306,263	753,982	1,060,245
May 2	616,912	23,040	453,448	403,467	689,933	1,093,400

The number of persons insured under the Acts of 1911 and 1916 included in these totals were 381,285 on February 28, 348,634 on March 28, and 305,330 on May 2. The table shows that during March there was a further increase in the number of persons employed, but this increase was more than accounted for by the number of demobilized men included, there being a decrease in the number of civilians whose policies were lodged. The same tendencies prevailed in April, though the total was not materially changed. Returns received from employers show, for the industries covered, an approximation to the volume of employment of a year ago, while total wages paid were 27 to 29 per cent. greater.

Week ending	Textile trades. Percentage change on a year ago.		All trades covered by the returns. Percentage change on a year ago.	
	Numbers employed.	Wages paid.	Numbers employed.	Wages paid.
March 22	−3·4	+28·5	+0·0	+26·9
May 3	−2·1	+28·0	+2·4	+29·2

German Trade Union returns, covering 2,399,000 members, showed 6 per cent. as unemployed at the end of February, the rate falling to 3·8 per cent. at the end of March, as compared with 0·9 per cent. in March, 1918. Reports received by the National Statistical Department indicate that in March the scarcity of coal and raw materials, the serious transport difficulties, the reduction of working hours, and the constantly rising wages, combined with decreased output and increasing disinclination for work, continued to have a restrictive influence, and as a consequence no essential change took place in the unsatisfactory industrial situation. In Holland the percentage of unemployed in all the Unions making returns continued its steady rise, from 11·8 in November, to 14·9 in December. If the diamond workers be excluded, the rise between these two months was from 10·8 to 13·1 per cent. In Norway the rate of unemployment, which stood at 2·1 per cent. in November, rose to 4·3 per cent. in December, and thereafter fell to 4 per cent. in January and 3 per cent. in February, as compared with 2·2 per cent. in February, 1918. Statistics of unemployment, as shown by Trade Union returns in Sweden, are available up to December, according to which the rate, which stood at 3·5 per cent. in September, rose to 3·7 in October, and after falling to 3·2 per cent. in November, rose again to 3·4 in December, as compared with 2·4 for the last month of 1917. But according to official statements published in the *Sociala Meddelanden* there was a distinct change for the worse in the general situation in November, which remained unrelieved up to February, and in the latter month relief works were opened to alleviate the prevalent distress.

The average rise of retail food prices in the United Kingdom since July, 1914, which was put at 120 per cent. on March 3, fell to 113 per cent. on April 1, and to 110 per cent. on May 1. In March, apart from a seasonal decrease in the price of eggs, the principal changes were associated, either directly or indirectly, with Government action, *e.g.*, the differentiation of retail tea prices, the decrease in the price of margarine, and the reduction in the price of Government cheese from 1*s.* 8*d.* to 1*s.* 6*d.* per lb. In April there were small seasonal decreases in the price of eggs and fish, and the introduction of summer milk prices brought the average price from 8¾*d.* to 7¼*d.* per quart. Against these decreases there has to be set an increase in the price of margarine from 9*d.* to 9¾*d.* per lb., following upon the remarkable rise in the price of raw materials with the removal of control from the latter.

After allowance for changes in consumption, the estimated increase in *expenditure* upon food, which was put at 79 per cent. on March 3, rose to 87 per cent. on April 1, and to 107 per cent. on May 1. The increase of the expenditure index is due to the further increase of supplies, notably those of dairy products and fish. A combination of the average increase in expenditure upon food since July, 1914, with the average increase in the retail prices of other items (including rents), yields a resultant increase of about 95 per cent. on April 1, falling to 90 per cent. on May 1. Since these figures do not allow for variation in the quantities purchased except in the case of food, they probably represent an over-estimate of the actual increase in general family expenditure.

In the Dominions generally, the latest data as quoted by the *Labour Gazette* show that the maximum point in food prices was reached about the end of the year. In Canada, on a fixed scale of living, the increase in food prices, which in December had stood at 84 per cent., fell by February to 80·7 per cent., while the estimated increase in total expenditure upon food, fuel, lighting, rent, &c., fell between the same two months from 53 per cent. to 50·7 per cent. The increase on pre-war food prices in New Zealand rose from 41·6 per cent. in October to 46·5 per cent. in December, and thereafter fell to 45·1 per cent. in January. In Australia the latest data available are for December, when the increase in food prices stood at 34·5 per cent. In South Africa, the upward tendency persisted into this year, the increase of the retail prices of articles entering family expenditure showing a further rise of 0·6 per cent. in February, bringing the total increase to 40 per cent. in Capetown. and 35 per cent. for the Union as a whole. In the United States retail food prices fell 7 per cent. between the middle of January and the middle of February, the total increase at the latter date being 77 per cent. on those of February, 1913. The general level of retail prices in French towns with over 10,000 inhabitants (excluding Paris) during the last quarter of 1918 showed a rise of 5·6 per cent. as compared with the preceding quarter, and of 160 per cent. as compared with the third quarter of 1914, while in Paris in January, 1919, the level of retail food prices was 148 per cent. higher than in July, 1914. The latest data available for Italian towns generally refer to September, 1918, when the increase in retail food prices on July, 1914, was 167·1 per cent. Later data are available for Rome, where in January the increase in food prices rose further to 159 per cent., as compared with the first half of 1914, and that of general expenditure rose to 141 per cent. In Milan in February the increase in food prices and in general expenditure were 298 per cent. and 253 per cent. respectively, showing practically no change on the preceding month, or, if account be taken of changes in consumption, the increases were 149 per cent. and 160 per cent. respectively.

In Sweden the increase of household expenditure since July, 1914, on the basis of fixed rates of consumption, was 234 per cent. in February, or a decrease of 1·5 per cent. on the preceding month. The estimate of expenditure in Norway is adjusted for changes in the rates of consumption, and on this basis general household expenditure rose by a further 0·5 per cent. in December, bringing the total increase since July, 1914, to 154 per cent. The corresponding increase for food alone was 175 per cent. In Switzerland the increase in the prices of food between June 1, 1914, and March 1, 1919, was 138·6 per cent., as compared with 132 per cent. on December 1, while if other household articles be included, the increase on March 1 was 157·4 per cent.

As regards wholesale prices in the United Kingdom, the *Statist* index number fell from 187·5 at the end of February to 184·7 at the end of March, and remained practically at the same level, 184·6, at the end of April, as compared with 82·4 for July, 1914. The *Economist* index showed a similar decrease during March from 263·8 to 259·4, but by the end of April it had moved upwards to 262·4. Both indices agree as to the effect of the removal of restrictions on prices and on export, *e.g.*, in textiles, and the increase of the *Economist* index in April relatively to that of the *Statist* is apparently due to the inclusion of quotations for iron anticipating the removal of controlled prices on May 1.

For the second time in succession, and also for the second time only, since the establishment of civil registration of births and deaths in England and Wales, the recently issued Quarterly Return of the Registrar-General for the first three months of the current year records an excess of deaths over births registered. The deaths numbered 191,922, and the births 144,920 in the whole country, corresponding rates being 15·6 per thousand population for total births in the whole country, and 22·4 for civilian deaths in towns of over 20,000 population. In the preceding quarter the birth-rate was 17·1 and the civilian town death-rate 27·0, the excess of total deaths over births being 79,443. These are serious figures, and have naturally occasioned some alarm, as, indeed, they should. Their significance, however, can easily be exaggerated unless regard is paid to the reasons for the excess of deaths. The main reason, undoubtedly, is the break-up of families involved by conscription for foreign service on the scale on which it was enforced in 1918, and to that factor there chanced to be added the great influenza mortalities of October–November, 1918, and February–March, 1919. Taking the year 1918 as a whole, its birth-rate was 17·7, or only just below that of 1917, 17·8. The civilian death-rate, however, rose from 14·4 to 17·6 per 1,000, entirely as the result of the great mortality from influenza. Restricting the comparison to 1917, therefore, makes it appear that the main cause of the alteration in ratio of births and deaths was influenza, but a more extended comparison puts a different aspect on the situation. Notwithstanding the fact that the deaths of the year, 611,991 in number (well over 100,000 of which were attributed to influenza), exceeded 600,000 for the first time in our records, the civilian death-rate of 17·6 per 1,000 (which under peace conditions would be a trifle higher than the total rate) is lower than any total death-rate recorded during the nineteenth century, except in four of its last seven years. But the lowest birth-rate in that century, 28·7 in its last year, was 62 per cent. higher than the rates of 1917 and 1918. Looking into the future the birth-rate appears to be both the most important and the most uncertain factor in the situation. A return of the death-rate to its recent usual level of 14–15 can probably be counted upon with some confidence; but it would be hazardous to venture any surmise as to the probable birth-rate after demobilization has had time to take effect. It stood at 23·8 in 1914, but a much lower figure must be anticipated in 1919, as till next autumn we shall still be feeling the full effects in this respect of the maximum mobilization of the whole war. Unless some other very fatal epidemic is experienced, however, the present quarter should record the restoration of excess of births over deaths. Of course we have only shared, and, in a comparatively mild degree, in an experience common to the belligerent nations. If we compare English and German towns in 1918 we find that, whilst the death-rates recorded are much the same in the two countries—19·2 in Berlin, 20·7 in Hamburg and 15·9 in Leipzig, as against 18·5 in London, 14·9 in Birmingham, 21 in Liverpool, and 17·9 in the 96 great towns jointly—the German birth rates have fallen far below ours, those for the three towns quoted being 11·4, 9, and 9·3 respectively, against 17·6, 20 and 24 in England, where the general rate for the great towns was 19·5.

An elaborate and comprehensive report recently issued (1918) by the Bureau of the United States Census, upon the deaf and dumb in 1910, well illustrates the difficulties of census inquiries into physical defects. In the first place the report relates, not to the 44,708 persons returned as deaf and dumb at the census enumeration, but only to the 19,153 of these who filled up and returned a special schedule of inquiry addressed, as in 1900 also, to all deaf-mutes enumerated at the census. Consequently the report relates, not to the deaf-mutes of the United States, but to a sample of less than 50 per cent. of these, and one, moreover, which is not regarded as in all respects typical of the whole. It had been intended to issue certain particulars regarding the whole 44,708 enumerated, and the reasons for abandoning this intention are instructive. It was found impossible to say what the total reported by the enumerators represented. On the one hand, it fell considerably short of including all deaf-mutes (*e.g.*, the enumerator whose district included the largest school for the deaf in the country returned none out of several hundred pupils as deaf and dumb, presumably because they had all acquired, in some degree, the faculty of articulation); and on the other hand, it included many who could not, under any interpretation, be regarded as deaf and dumb. This difficulty of so defining the degree of defect included in the census category of blind, deaf and dumb, imbecile, or other physical or mental defect, that the definition can be successfully applied by enumerators, as in the present instance, or by the general public, as in this country, is so great that the success attained in most other countries is probably no greater than in the United States. It would probably, in fact, be less in many cases, as the difficulty of successful definition for householders must be even greater than for enumerators, who can in theory be required to apply a common standard. If the material collected at the censuses of other countries were subjected to scrutiny as critical as was applied in this case, and if the alternative of falling back upon more reliable material provided by a special inquiry were available, the course followed in the American report might not infrequently be followed. It is to be remembered, however, that this in no sense provides a census of the deaf and dumb. The attempt to take such a census is admitted to have failed, as doubtless it frequently, not to say generally, fails in other countries. The study of the 19,153 special inquiry schedules satisfactorily completed has been excellently carried out in co-operation with experts in otology and in the care of deaf-mutes. It includes summaries of census data in all parts of the world, from which it appears that they are characterised by a certain correspondence in regard to such elementary matters as age and sex (males everywhere in excess). The age when hearing was lost, the causes of deafness, including heredity, the education of the deaf, their means of communication, ability to read lips, and their occupations and economic status are all carefully dealt with in considerable detail; and the report will undoubtedly be of much value to those interested in these matters.

Those who were present at the meeting of the Society on April 15 will not be surprised to see that the topics so energetically debated then have been made the subject of controversy elsewhere. In its issue of April 12 the *New Statesman* published a vigorous criticism of the Sumner Committee's report, which provoked a reply from Professor Bowley, and from a correspondent using the pen-name of "Statistician," in the issue of May 3. The debate was continued in letters from the writer of the original article and from "Statistician," which appeared on May 10 and May 31 respectively. The *Daily News*, of April 29. contained an article upon the subject by Sir Leo Money, to which Professor Bowley replied upon May 1. We do not gather that the assailants of the Sumner report and Dr. Bowley dispute the proposition that, during the period over which the data were collected, it would have been physically impossible to secure commodities in amounts having the 1914 weights; their contention is, either that the purchasers were entitled to such hedonistic substitutes as were obtainable for the extra wage payment which, under other conditions, might have secured the commodities, or that in the immediate future it will be possible to revert to the 1914 standard of consumption provided wages are suitably increased. Neither contention can be discussed here. From the purely statistical standpoint, it is regrettable that Sir Leo Money, writing in a journal, the readers of which had not an opportunity of perusing Professor Bowley's paper, should contemptuously dismiss his detailed analysis of sample budgets with the remark that "it is well known "that families able and willing to provide such budgets are not "typical families." The statistician will ask: "Well known to "*whom* and not typical of *what*?"

In his *Organización de la Estadística en España*, Señor Rodon has given a brief account of the official statistical publications of Spain, with comments on their individual worth. This varies greatly, and the author's examination supports a plea for organization and regularization of the output. The second National Economic Congress, held at Madrid in 1917, strongly recommended the institution of a central office to co-ordinate the work of the various State Departments, but no result has followed. An *Oficina de Estadística,* we learn, was created by royal decree in 1802, becoming, later, the *Dirección General de Estadística;* it was never, however, very effective, and disappeared on the establishment of the *Instituto de Geografica y Estadística* in 1893. This comprehensive and efficient institution has remained the principal statistical organization in the kingdom, and is responsible for all vital and population statistics, including those of recruiting and substitution in the army as well as for its special departments of Geography, Geodesy, Astronomy, Meteorology and Metrology. Other departments publish their own statistics, and are unequally served, the statistics relating to industry being especially inadequate. The *Comisión protectora de la Producción Nacional* has apparently not yet issued any statistics, and the Madrid Congress, before referred to, drew attention to the paucity of information on industrial matters. The author urges the preparation of a Census of Production, and holds up that of this country, taken in 1906, as a model. The speciality of Spain is in the department of financial statistics. These emanate from the several divisions of the *Ministerio de Hacienda,* whose output is regular, voluminous and complete. The Admiralty publications are scanty, and in some cases deficient; the *Memorias diplomaticas y consulares* are, on the contrary, most valuable, but, according to Señor Rodon, they are better appreciated, or at all events more utilised, in countries outside Spain.

Dr. Anders Nicolai Kiaer.

Statistical science, not only in Norway but throughout the civilised world, has sustained a serious loss by the death of Dr. Anders Nicolai Kiaer, which occurred at Christiania on April 16 last, at the ripe age of 80.

Although Dr. Kiaer had for some years been superannuated from the post of Head of the Central Bureau of Statistics for the Kingdom of Norway, he was still interested and indeed occupied with studies connected with International Statistics, up to within a few days of his death.

Having as a comparatively young man succeeded to a high position in the Statistical Bureau at Christiania, he was able to take an active part in the International Statistical Congresses which took place in 1867, 1869 and 1872 respectively at Florence, The Hague and Petrograd. These Congresses were mainly run by the official Heads of Statistical Departments, and were conducted and paid for by the Government where the Congress was held. Professors and publicists had little or no influence there, and it was in great measure to widen their basis that in 1885, when the Statistical

Society was holding its Jubilee in London and was favoured by the presence of many foreign guests, the International Statistical Institute was formed, with its free constitution and individual subscriptions of its members. The Institute also provided machinery by means of its Bulletin and Committees for carrying on the work between its biennial sessions.

Naturally Kiaer, as the representative of an essentially free country, took much interest in the new Institute, and was present not only at its birth in London in 1885, but also at all the Sessions up to the one at Vienna in 1913, which was the last held. He contributed Papers on various subjects, treated internationally, during all this period, and it is certain that the increased uniformity and comparability of the statistics issued by the various Governments has been immensely assisted by the work done by Dr. Kiaer and other statisticians who followed the fortunes of the Institute. Kiaer's first report in this connection was on the unification of systems of tonnage—written in 1876—and his latest, on the distribution of income and property, was made to the Statistical Institute at Vienna in 1913. Having at an early age obtained a high position in the statistical world, Kiaer was chosen as an Honorary Fellow of the Royal Statistical Society so long ago as 1874, and he has been a frequent donor to the Library of the Society. He was also an Honorary Fellow of the American Association of Statistics and of the Statistical Society of Paris, besides being a member of the Society of Science at Christiania and at Stockholm

The statistics of Norway have owed a great deal to the wise initiative and intelligence of Dr. Kiaer during the half century or more that he administered the Bureau. While Dr. Kiaer felt very deeply the interruption of the work of the International Statistical Institute caused by the war, his sympathies were less pronounced on the side of the Allies than were those of most of his countrymen. This, however, did not put an end to the affectionate correspondence which he kept up with his English friends, nor will it prevent us of the "old guard" in the Statistical Society from recording our deep regret at losing our old comrade, Dr. Anders Nicolai Kiaer.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

The Accountant. April 19, 1919—Multiple Dividend Warrants.

Bankers' Magazine—

May, 1919—After the War: the reconstruction period. The National Revenue.

June, 1919—After the War: the reconstruction period. The Budget. The Treaty of Peace.

Imperial Institute, Bulletin. October–December, 1918—Minerals from Rhodesia. The Empire's trade in Wool in its relation to the Wool trade of the World.

Institute of Actuaries, Journal. April, 1919—Newton's Interpolation Formulas. Further Notes: *Fraser* (*Duncan C.*), *M.A.*, *F.I.A.* The American-Canadian Mortality Investigation, 1900–1915.

Institute of Bankers, Journal. May, 1919—The Economic Outlook: *Crammond* (*Edgar*).

Public Health. May, 1919—The Medical Services under a Ministry of Health: *Parker* (*C. A.*).

Royal Society of Arts, Journal—

April 25—British Engineering and Waterpower Development: *Gibson* (*Professor A. H.*).

May 2—Flax—Cultivation, preparation, spinning, weaving: *Boase* (*W. Norman*).

May 9—Infant Mortality and Housing: *Hill* (*Leonard*).

May 23—Railway Transport in the United Kingdom: *Kelway-Bamber* (*H.*), *M.V.O.*

INDIA—

Indian Journal of Economics. December, 1918—Practice of Co-operation: *Mehta* (*Nanalal C.*). The Art of Economic Development (contd.): VI. Objects of Development: *Jevons* (*H. Stanley*). The Indian Income Tax: *Pagar* (*S. M.*). The Price of Land in the Punjab: *Calvert* (*H.*). The Relative Prices of Food Grains: *O'Byrne* (*G. J. E.*).

Wealth of India. February, 1919—Sir Daniel Hamilton's proposal: *Wolff* (*H. W.*). The Paper Making Industry: *Raitt* (*R. W.*).

CANADA—

Royal Society of Canada, Transactions. June and September, 1918—The inheritance of the length of the flowering and ripening periods in wheat: *Thompson* (*W. P.*). Le partage de l'immigration canadienne depuis 1900: *Pelletier* (*Georges*).

UNITED STATES—

Annals of the American Academy of Political and Social Science May, 1919—A series of articles on International Economics by various authors: Parts I and VII. Economic Internationalism; Part II. Food and Raw Materials; Part III. Foreign Trade and Markets; Part IV. International Finance; Part V. International Labour; Part VI. Government Direction of Trade and Industry.

American Economic Review. March, 1919—The Procedure of Contemporary Railway Reorganization: *Dewing* (*Arthur S.*). The War-Tax Paradox: *Davenport* (*J. H.*). Price Fixing in a Competitive Industry. A Pioneer Case: *Haney* (*Lewis H.*). The Federal Farm Loan System: *Putnam* (*George E.*). Labour Turnover: *Eberle* (*George J.*).

Supplement. March, 1919—Economists in Public Service. Annual Address of the President: *Fisher* (*Irving*). Interest on Investment as a Factor in Manufacturing Costs: *Scovell* (*Clinton H.*). Effect of Government Control on Marketing Methods and Costs: *Hibbard* (*B. H.*). Provisions of the Food Act and activities which should be made permanent: *Gephart* (*W. F.*). The War and the Supply of Capital: *Friday* (*David*). The War and the Rate of Interest: *Kemmerer* (*E. W.*). The Possibility of Compiling an Index of the Cost of Living: *Meeker* (*Royal*). After-War Readjustment: Liberating Gold: *Miller* (*A. C.*). The Agricultural Ladder: *Spillman* (*W. J.*). Tenancy in an Ideal System of Landed Property: *Galpin* (*Charles J.*) and *Ely* (*Richard T.*). Land Tenure and Public Policy: *Kent* (*William*). The Economic Factors in the Maintenance of Peace: *Vollenhoven* (*C. van*).

American Journal of Sociology. March, 1919—Probable economic future of American Women: *Snedden* (*David*).

American Statistical Association. March, 1919—A round table discussion of Federal Statistics. Statistics and Government: *Mitchell* (*Wesley C.*). Statistics of the United States Shipping Board: *Secrist* (*Horace*). The Statistical work of the War Industries Board: *Wolman* (*Leo*). The Statistical work of the War Trade Board: *Swanson* (*Arthur E.*). The Central Bureau of Planning and Statistics: (*Potter Z. L.*).

Journal of Political Economy. April, 1919—The Industrial Outlook: *Reed* (*H. L.*). The War Housing Program and its Future: *Hitchcock* (*C. N.*). Reconstruction and Natural Resources: *Zon* (*R.*).

Political Science Quarterly. March, 1919—Difficulties of World Organization: *Blachly* (*F. F.*) and *Oatman* (*M. E.*). Price Fixing in the United States during the War. I.: *Haney* (*Lewis H.*).

EGYPT—

L'Égypte Contemporaine. April, 1919—Quelques remarques sur le fonctionnement des Sociétés co-opératives agricoles en Égypte: *Sadik Bey Henein.*

FRANCE—

Bulletin de Statistique et de Législation Comparée—

February, 1919—La Production des alcools en 1917 et 1918.

March, 1919—La production des vins et des cidres en 1918. Belgium: La Banque nationale sous l'occupation allemande (1914–1918). Suisse: Budget de l'exercice 1919.

Journal des Économistes—

April, 1919—La tyrannie socialiste et le triomphe de Karl Marx: *Yves-Guyot*. Réflexions d'économiste: Situation ouvrière en Angleterre. Réforme monétaire et fiscale en Bohème. Question des changes à Paris: *Raffalovich* (*A.*). L'Unification de l'Afrique du Nord: *Bernard* (*François*). Le Désarmement et la liberté des mers: *Lambert* (*Henri*). L'Effort canadien pour la guerre mondiale: *Dewavrin* (*Maurice*).

May, 1919—Les Grandes Compagnies de chemins de fer en 1918: *Nouvion* (*Georges de*). La Circulation fiduciaire et l'Or aux Etats-Unis durant la guerre: *Raffalovich* (*Arthur*). Le Bolchevisme en Russie: *Raffalovich* (*Arthur*).

Journal de la Société de Statistique de Paris—

April, 1919—La Caisse de la Confédération Helvétique: *Dewavrin* (*Maurice*).

Revue d'Économie Politique—

March–April, 1919—La politique française en matière d'importation pendant la guerre: *Aftalion* (*Albert*). Le mouvement de la population pendant la guerre dans la France non envahie: *Bourdon* (*Jean*). Les relations commerciales germano-russes et l'avenir: *Glasoff* (*Vladimir*). Les causes de la hausse des prix: *Mourre* (*Le Baron Charles*).

ITALY—

Giornale degli Economisti—

March, 1919—Problemi economici dell' Italia alla Conferenza di Parigi: *Cabiati* (*Attilio*). L' impiego delle macchine in agricoltura: *Marenghi* (*E.*). Movimenti operai e riduzione delle ore di lavoro nelle industrie Inglesi: *Nola* (*Carlo Di*).

April, 1919—Il Censimento dei profughi di guerra: *Castrilli* (*Vincenzo*). Il vizio organico della proprieta territoriale in Sardegna: *Vinelli* (*Marcello*), La Situazione economica: *Amoroso* (*Luigi*).

La Riforma Sociale. *March–April*, 1919—La ricchezza nazionale e il costo economico della guerra: *Jannaccone* (*Pasquale*). La Liquidazione dei debiti di guerra: *Scott* (*William Robert*). Gli Effetti dei censimenti delle denuncie e dei sequestri: *Patetta* (*Federico*).

LIST OF ADDITIONS TO THE LIBRARY.

Since March, 1919, the Society has received the publications enumerated below.

Note.—Periodical publications are not included in this list, but they will be acknowledged at the end of the volume.

I. OFFICIAL PUBLICATIONS.

(a) United Kingdom and its several Divisions.

United Kingdom—

Mines and Quarries. Output of Coal and other Minerals: Number of Persons Employed, 1918. (Advance proof, subject to correction of the Tables forming part of the General Report for 1918.) 7 pp., fol. London, 1918. (The Home Office.)

England and Wales. Registrar-General's Report of Births, Deaths and Marriages, 1917. 496 pp., 8vo. London, 1919. 5*s.* net. (The Registrar-General.)

—— Supplement to the Annual Report of the Registrar-General of Births, Deaths and Marriages in England and Wales. Part III, Registration Summary Tables. (1901–10.) 765 pp., fol. London, 1919. Price 8*s.* net. (The Registrar-General.)

(b) India and Dominions.

India—

Education. Progress of Education in India, 1912–1917. (Seventh Quinquennial Review, Vol. II.) 200 pp., fol. Calcutta, 1919. Price 3*s.* (Bureau of Education, India.)

Industry. Indian Industrial Commission, 1916-18 Report. 355 + xviii pp., 8vo. Calcutta, 1918. Price 1*s.* 6*d.* Appendices to the Report. 183 pp., fol. Calcutta, 1919. (The Commission.)

Canada—

Industry. Census of Industry, 1917. Part IV. Section 4. Pulp and Paper. 52 + xi pp., 8vo. Ottawa, 1919. Price 5 cents. (Dominion Bureau of Statistics.)

Natural Resources Intelligence Branch, Department of the Interior. The new Manitoba District: its resources and development. 41 pp., 8vo. Ottawa, 1919. Map showing the Land Registration and Judicial Districts of Manitoba, Saskatchewan and Alberta. (The Department.)

Ontario. Agriculture. Ontario Agricultural College, Bulletin 268. Farm Crops: results of experiments at the Ontario Agricultural College. By C. A. Zavitz. 80 pp., 8vo. Toronto, 1919. (Ontario Department of Agriculture.)

—— Bulletin 269. Hay and Pasture Crops, Grasses, Clovers, etc. By C. A. Zavitz, B.S.A., and W. J. Squirrell, B.S.A. 72 pp., 8vo. Toronto 1919. (*Id.*)

New Zealand—

Census. October 15th, 1916. Part X. Race Aliens. 24 pp., 8vo. Wellington, 1918. (The Government Statistician.)

(c) Foreign Countries.

Belgium—

Académie Royale. Fondations Académiques: Prix (Pierre J.) et Edouard Van Beneden. 3 pp., 8vo. Brussels. (The Academy.)

—— Rapport Succinct sur l'état du Palais des Académies après le départ des Allemands. Par Louis le Nain. 7 pp., text with 8 photographs. Brussels, 1919. (Academie Royale.)

Industry. La Situation des Industries en Belgique. 60 pp., 8vo. Bruxelles, 1919. (Ministère de l'Industrie.)

Labour. Statistique des Accidents du Travail, 1907. 417 pp., 4to. Bruxelles, 1919. (*Id.*)

—— Annuaire de la Législation du Travail. 853 pp., 8vo. Bruxelles, 1919. (*Id.*)

—— Le Secours aux Chômeurs. Compte rendu des Travaux et des Conclusions de la Commission Spéciale du Chômage. 36 pp., 8vo. Brussels. April, 1918. (*Id.*)

—— Rapports Annuels de l'Inspection du Travail, 1913. 558 pp., 8vo. Bruxelles, 1919. (*Id.*)

Mines. Annales des Mines de Belgique, Annee, 1919. (Tome XX. 2me, Livraison.) 757 pp., 8vo. Bruxelles, 1919. (Admin. des Mines.)

France—

Finances. La France Financière et Economique. Tome I. 336 pp., 8vo. Paris, 1919. Price 8 fr. 50. (Ministère des Finances.)

Italy—

Milan. Savings Banks. Istituto di Milano per le Case Popolari od economiche, 1917–1918. 35 pp., 8vo. Milan, 1919. (The Institute.)

Portugal—

Census. Censo da População da Cidade de Lisboa, 1911. 208 pp., 8vo. Lisbon, 1918. (Ministério das Finanças.)

Sweden—

Elections, 1918. 103 pp., 8vo. Stockholm, 1919. (Bibl. de la R. Univ. de Uppsala.)

Water power. Monterade Vattenkraft. 258 pp., 8vo. Stockholm, 1919. (Bureau Central de Statistique.)

United States—

Children's Bureau. An Outline for a Birth Registration Test. (Bureau Publication No. 54.) 13 pp., 8vo. Washington, 1919. (The Bureau.)

Education. Educational Work of the Churches in 1916–18. Bulletin, 1919, No. 10. Department of the Interior (Advance Sheets from the Biennial Survey of Education, 1916–18. 53 pp., 8vo. Washington, 1919. (Government Printing Office.)

Connecticut. Labour. Report of the Bureau of Labour on the Conditions of Wage-Earners in the State, 1918. 8vo., 144 pp. Hartford, 1919. (The Bureau.)

—— Labour Laws. Revision of, 1918. 91 pp., 8vo. Hartford, 1919. (*Id.*)

New York State—

Labour. The Industrial Replacement of Men by Women in the State of New York. (Department of Labour, Special Bulletin No. 93). 68 pp., 8vo. March, 1919. (The Department.)

—— Proceedings of the Third Industrial Safety Congress. 225 pp., 8vo. Syracuse, N.Y., 1918. (State Industrial Commission.)

(c) **Foreign Countries**—*Contd.*

United States—*Contd.*

Ohio. Industrial Commission. Bulletin of the Industrial Commission of Ohio. Vol. v., No. 1. Union Scale of Wages and Hours of Labour in Ohio on May 15th, 1918. 46 pp., 8vo. Columbus, Ohio, 1919. (The Commission.)

—— Statistics of Mines and Quarries in Ohio. Bulletin of the Industrial Commission, Vol. v., No. 2. 98 pp., 8vo. Columbus, Ohio, 1919. (*Id.*)

(d) **International.**

Institut International de Statistique—

Bulletin. Tome XX. Livraisons I. II. et Supplement. 3 vols., 8vo. Hague, 1916. (The Institute.)

II. AUTHORS AND MISCELLANEOUS.

Booth (*Charles*). A Memoir. 176 pp., 8vo. London, 1918. (Mr. G. M. Booth.)

Business Prospects Year Book, 1919. Edited by C. P. Hailey and D. Willson Lloyd. 258 pp., 8vo. Cardiff and London, 1919. 10*s.* net. (Mr. D. Willson Lloyd.)

Carnegie Endowment for International Peace (Division of Economics and History)—

Effects of the War upon Insurance, with special reference to the Substitution of Insurance for Pensions. By William F. Gephart. 302 pp., large 8vo. New York, 1918. Price 4*s.* 6*d.* (Humphrey Milford.)

Economic Effects of the War upon Women and Children in Great Britain. By Irene Osgood Andrews and Margaretta Hobbs. 190 pp., 8vo. New York, 1918. Price 4*s.* 6*d.* (Humphrey Milford.)

Carnegie Endowment for International Peace—Preliminary Economic Studies of the War—

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JOURNAL

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The Wealth and Income of the Chief Powers.

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[Read before the Royal Statistical Society, May 20, 1919.
The Ex-President, Sir Bernard Mallet, K.C.B., in the chair.]

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1. Introductory Remarks.

> "In representing the wealth of nations as consisting, not "in the unconsumable riches of money, but in the consumable "goods annually reproduced by the labour of the Society ". . . (their) doctrine seems to be in every respect as just as "it is generous and liberal. . . . They have for some years "past made a pretty considerable sect, distinguished in the "French Republic of letters by the name of 'Economists.'"—
> *Adam Smith.*

No apology is needed for dealing with this subject at the present time when the air is filled with discussions about national wealth, capital levies, indemnities and kindred questions. We are all familiar with the class of persons who profess to despise and distrust statistics and statistical methods. They are usually the first to rush to statistics when they are in trouble, and to use them without investigation or discrimination. While there is a very considerable literature upon this particular subject—running into many scores of works—it is extraordinary how the less responsible efforts, often mere partisan guesses, gain a footing and keep currency with serious and reasoned estimates. This arises partly from the fact that the partisan who is out to prove his point is nearly always best pleased by an extreme figure, and so we find that current estimates of the wealth of the United Kingdom (in 1914) used in polemical literature, range from 10,000 millions to 24,000 millions sterling.

At another moment the fickle user of figures seeks to prove that statistics of wealth have no real meaning, that they assume an impossible and sudden realisation of all commodities, that they omit certain items of well-being, and so on; and because estimates made up on one particular principle are not really serviceable for every possible use, they are condemned as being useful for none. The very wide variations that exist in estimates purporting to represent the same facts—for the popular use of statistics dislikes all qualifications, and drops out all footnotes or definitions—is perhaps one of the chief reasons for the ultimate distrust. And yet, of course, proposals for progress in modern civilisation and solutions of its problems depend to an increasing extent not merely upon correct aggregations and classifications of numbers, but also still more upon methods of estimation, or statistical science as distinct from State-arithmetic, in those fields where precise measurement or enumeration is not possible.

The uses to which estimates of national wealth and income may be put are many and various. They include:—

1. Tests of "progress" by way of comparisons between different years, to show the accumulation of capital; tests of the distribution of wealth, according to the form or embodiment which wealth takes; of the effects of changes in the rate of interest, or in the value of money.

2. Tests of the relative "prosperity" or resources of different nations or communities, either as a whole or per head of the population, and in relation to their national debts.

3. Comparisons of income with capital and property.

4. Considerations of the distribution of wealth according to individual fortunes, and changes in that distribution.

5. Consideration of the applicability and yield of schemes of taxation, *e.g.*, the capital levy.

6. Questions relating to War indemnities.

It is in connection rather with the second, fifth and sixth classes above that the public mind is most exercised at the present moment, and a great deal of careful, as well as much careless, work has quite recently been done in this field of statistics.

It is perhaps hardly necessary to say that the capital wealth or income *at any given moment* is not a sole test of ability to bear indemnities—it is only a partial measure, and the potential wealth in ungotten minerals and resources, as well as the character of commerce and *distribution* of income, are important factors in the problem. It may, however, be pointed out that present values are on a very different scale from those which are being discussed in this paper, and the true money measure of present wealth can only be guessed at for some time yet.

2. THE OBJECT OF THIS PAPER.

The objects of the present treatment of the subject are :—

1. To review the great mass of recent work from different countries, and to select the most authoritative and careful efforts, presenting the main results for the British reader within the limits of a single paper.

2. To present those results in a uniform notation in currency, adjusted as at a uniform date, 1914, and to relate them as nearly as possible to like subject-matter for each country. The year 1914, as at the outbreak of war, represents the latest date for which satisfactory statistics are generally available. No useful work can be done on any later year, so great is the disturbing effect of war. As soon as stable conditions are again reached, and proper measurements can be made, not only will 1914 serve as a point from which to measure the effects of war, but it will also serve to show the *comparative* changes for different nations.

3. To subject the data and methods involved to careful analysis and criticism, so far as that may be possible. At present, estimates of every kind, good, bad and indifferent, pass muster together as equals. I shall endeavour to label them according to their probable degree of approximation to the facts, or rather, according to the extent I feel able to say that they cannot be inaccurate. Here I shall use the term "possible range of error" out of the ordinary signification attaching to "probable error," and to bear the following meaning :—

The estimate under each detailed head is considered, and the extent to which it may possibly be deficient or excessive is judged by reference to the character of the data and the methods employed.

The "minus" range of error is not always equal to the "plus" range; as, for example, in the case of an aggregated valuation used for taxation, which is not nearly so likely to be excessive as it is to be deficient, in normal circumstances. All the "minuses" and all the "pluses" are then separately totalled. It will be obvious that as all the details are unlikely to err in the *same* direction, the final aggregate valuation is probably much closer to the absolute truth than this "possible range of error" would indicate, and the latter usually expresses a generous estimate for the *probable* error.[1] The determination of these percentages rests on no absolute or external criteria—they are purely subjective judgments of my own, and, therefore, the personal equation must be very prominent. There is, however, this one limit to that disadvantage—the *same* personal equation runs throughout all the estimates of error, and they are not the products of different observers. In order that some kind of relative value may be attached to the different estimates of national wealth, I have introduced for the purposes of my final table, in which they would otherwise appear as of equal reliability, a system of grading. Those cases in which the "possible range of "error" is not greater than 10 per cent. of the whole estimate are classed as Grade I. Those where it *may* be more than 10 but not more than 20 per cent. are called Grade II, and those similarly between 20 per cent. and 30 per cent. Grade III, while the mere "guesses" not based on recent broad data are put in Grade IV. An estimate that at the time might have been put in one grade may, so far as the final summary for 1914 is concerned, be re-graded in a lower category if in bringing it up to the level of 1914 further possibility of error is introduced. As this is the first effort of the kind, I offer every apology for its empirical and elementary character, but I think it represents an attempted advance in this realm of comparative statistics.

4. The final object—which, however, in point of arrangement comes first—is to discuss briefly the various methods that are available for the determination of national income and national capital, and their chief characteristics or limitations, for I feel that many readers may have but little information before them on this subject. I shall also add a brief and selected bibliography of recent work. An extensive list, down to 1913, is contained in Corrado Gini's great work, "L'Ammontare e la Composizione della Ricchezza delle Nazioni," enumerating some three to four hundred references, mainly for capital

[1] While I should not care to give a precise expression for the *probable* error in these circumstances, I do not think it would ordinarily exceed $\frac{3}{2}\sqrt{p}$, where p is the "possible range of error," + or −.

only. A good statement of recent contributions is given by Lanfranco Maroi in "Come si calcola e a quanto ammonta la ricchezza "d'Italia e delle altre principali nazioni," while the official report of the Australian census has a list of about one hundred and thirty references.

I have included very few references to the earlier estimates in each country, however well known or valuable, for reasons of space. In the first place, the further removed they are from 1914 the more risky it is to "build" up on them to reach a figure for that date. In the second place, all competent investigators can be relied upon to make the most of the work of their predecessors, and to use it so far as it is valuable.

For reasons of space also, I shall not touch upon the measurement of progress in the different countries, or the comparative distribution of property and income, or to any extent on the proportions of capital which are represented by different classes of property. These topics may form in themselves suitable matter for further papers at a later date.

3. General Observations on Comparisons in Wealth.

> "The nutrition of a Commonwealth consisteth in the Plenty "and *Distribution of materials* conducing to life: In Concoction or "Preparation . . .
>
> "By Concoction, I understand the reducing of all commodities "which are not presently consumed, but reserved for nourish-"ment in time to come, to something of equal value . . . "and this is nothing else but gold, and silver, and money. "For gold and silver being (as it happens) almost in all countries "of the world highly valued, is a commodious measure of the "value of all things else between nations. . . . By the means "of which measure, all commodities, moveable and immoveable, "are made to accompany a man to all places of his resort, "within and without the place of his ordinary residence; and "the same passeth from man to man within the Common-"wealth, and goes round about, nourishing (as it passeth) every "part thereof; in so much as this concoction is, as it were, "the signification of the Commonwealth."—*Hobbes.*

In my experience, for the sake at any rate of those readers who are new to the subject, it is never wise to set abroad comparisons of this character without reference—even at the risk of repetition—to the chief limitations and dangers involved. I have dealt with some aspects of the subject in "British Incomes and Property."

(i) It is obvious that the aggregate wealth of a tribal community measured in cowrie shells (even if the valuation in shells were reduced to sterling at the "par of exchange" for such shells with a gold currency) would not be comparable with the wealth of a civilised community. There would be many things by which the native sets great store, and which, in short, are valuable to him, but have no merit in the eyes of a European, while many treasures to a European would be "worthless" to the native. The two countries might theoretically contain each the same physical objects of possession, and yet register quite different aggregates of "wealth." The illustration is, of course, an extreme one, but it is intended to bring out the fact that in the countries to be compared men must care for the same objects in a similar way, and their scale of relative values must be akin. To the extent to which countries diverge in this respect, the comparisons will be invalid.

(ii) Consideration of the aggregate of gross personal wealth without regard to a national debt, and the taxation consequent thereon (even if the whole debt is held at home), may lead to ridiculous results. The stock may be wealth in the hands of the investors, but it is a concealed liability, by way of taxation, on the incomes and capital generally.[1]

The usual way, and I think the best way, of treating this matter in the past, has been to count as wealth the individual holdings in Government stock, but to *deduct the debt as a mortgage* on the property owned by the State or collective community. The practice of valuing national wealth varies in different countries, some being much more inclusive in the matter of State property, and this difference would be a source of trouble in making comparisons if the gross value were in question. But the amount of the net capital, after deducting the debt, is so much smaller that its bears a relatively insignificant proportion to the whole national capital, and so this method of deducting the debt tends to diminish the difficulty and the importance of the exact comparability of the estimates for different countries so far as the year 1914 is concerned. In all comparisons and estimates for later years the matter will assume great importance, for the deduction of the debt from State property will often give a minus quantity, which for many purposes, though not for all, should reduce the aggregate of personal wealth.[2]

(iii) The wealth of a country may mean *either* the value of the objects found within its boundaries, *or* the wealth of the inhabitants, including their foreign possessions, and excluding wealth within the country held by people abroad. The confusion between these two ideas has played havoc with discussions on such subjects as the "Taxable Capacity of Ireland."[1] It is the latter sense—the wealth of the inhabitants—that is mainly under consideration in this paper. That aspect is foremost when questions of taxation are prominent, but there are matters, such as the inalienable wealth of a country in a geographical sense (for warlike purposes) for which the former is important. A colony capitalised from the home country may be poor by the wealth of its inhabitants, but rich in its resources and the actual yield within its borders.

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[1] *British Incomes*, p. 390.

[2] *Vide* "An estimate of the capital wealth of the United Kingdom in private hands." *Economic Journal*, September, 1918.

(iv) Wealth in private hands is not easy to define exactly, for there are various shades of ownership :—

(*a*) Absolute personal disposition of the whole value.

(*b*) Trust interests.

(*c*) Collective ownership with only potential specific allocation to individuals, such as the reserves of companies which may be of higher value in the hands of the company than the aggregation of the market value of individual interests therein.

(*d*) Collective ownership, without the possibility of individual allocation, social private wealth, such as churches, clubs, etc.

Similarly, communal wealth is not all of the same degree of "dispersion" in value :—

(*a*) City and local property like waterworks, buildings and trams, having a "value" determinable by deliberate comparison with privately owned objects.

(*b*) National property, varying from a museum to a navy.

The closeness with which a "market value" can be assigned varies with the class of wealth, for, if there is no possibility of a market, one naturally tends towards the adoption of the cost of production or reproduction. Moreover, some of the comparisons of national wealth are slightly impaired by the extent to which the methods employed give different recognition of each class.

(v) So far as "income" is concerned, there are other considerations, which I have set out in "British Incomes," and will not repeat here, except one—by way of illustration—viz., the non-inclusion of a valuation of domestic services by a wife to her husband and home which would lead to a difficulty in comparisons between countries of different social habits. For example, if we suppose that in one country one million wives remain at home and one million women work in industry, and there are no domestic servants, the total "income" will differ from that of a country where half the "wives" work in industry and half the other women are domestic servants in the homes of the absent wives, despite the fact that the total "work" being done is the same in both cases.

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[1] *British Incomes*, p. 369.

(vi) In countries where values vary widely at short intervals for "stock" or produce which bulks largely in the total valuation, there may be more difficulty in securing a valuation on normal conditions.

4. VARIOUS METHODS OF COMPUTING WEALTH AND INCOME.

Stated quite briefly, the available methods for computing National capital in different countries are as follows:—

(I) *Based on Data arising through the Taxation of Incomes.*

(*a*) *Collective Taxation or Taxation at the Source.*—The statistics of such taxation covering the whole profits of corporate bodies, like public companies, before distribution or whether distributed or not, obviously lead to comprehensive results. Where *sources* of income are attacked for revenue purposes, and the destination of income is ignored, it is not necessary for elaborate estimates to be made for income remaining in collective or semi-collective ownership; moreover, such a system allows of profits being presented for different *classes* of business or income, and so enables them to be capitalised on an appropriate basis. There may, however, be a danger that this method will give too high a result, if sufficient allowance is not made for income going to foreigners or persons living entirely abroad which thus forms no part of the national income. If the tax is on the British model, which taxes in full *both* income originating abroad and accruing to persons residing in the United Kingdom, *and* income originating in the United Kingdom and accruing to persons abroad, this difficulty is inherent in the method, and perhaps sufficient recognition has never yet been given to it. Liability to error arises in three ways:—

(i) Evasion in the tax.

(ii) Omissions from the scheme of tax (*i.e.*, "garden produce" as taxable income; "enjoyment" income from movable property).

(iii) The basis of capitalisation, viz., the number of years purchase adopted.

This method, generally known as the "Giffen" method, though not invented by him, is the main basis for the valuation for the United Kingdom. It will be to a limited extent available in the United States, South Africa and other colonies.

(*b*) *Taxation of Income on Individual Returns.*—Where statistics of this character are available, they may be utilised for capital valuations, but only with some difficulty. If there is a rough division of income into earned income and income from property, it is of course of assistance in the capitalisation. The chief defects are :—

(i) The considerable extent to which evasion takes place.

(ii) Omission of all income held collectively.

(iii) Difficulty in determining the ratio of income to capital on the average, which makes capitalisation a far greater difficulty than under (*a*) (iii) above.

(*II*) *Based on Data arising through Annual Taxation of Capital.*

(*a*) *Particular Classes of Property, such as Land or Buildings.*—Obviously these particulars supply a part only of the whole capital valuation, and they more properly belong to the "inventory "method" referred to below. Unless the values are revised regularly on uniform lines, without local differences, they form but a rude basis, and there are always difficulties in determining the extent to which other forms of wealth (*i.e.*, shares or business profits) duplicate these values. Some of the Continental systems of taxation supply material of this order, and the Australian States have regularly revised valuations which are valuable because they constitute so large a fraction of the total wealth.

(*b*) *General Property Valuation.*—The particulars furnished by a system of annual taxation upon all classes of property, should, in theory, form an ideal basis for a valuation. But unfortunately, in practice, such a tax as the General Property Tax in the United States is full of defects. The valuations of personal property tend to disappear altogether (as was the case during the eighteenth century with our own "Land Tax") or to be negligible, and thus real property alone remains to bear the burden. This real property is assessed on very diverse lines in different areas, and is admittedly much below the selling values in many States. These facts are commonplaces to all students of American taxation. In effect, therefore, this class is not really distinguishable from II (*a*) above and the information gained is never enough for a complete valuation, but becomes only a factor in the inventory methods.

III.—Based on Data arising through Taxation of Capital at Irregular Periods.

(*a*) *Statistics of "Estates" chargeable with duties on passing at Death.*—This method has the appearance of being the most satisfactory and scientific of all. A special *ad hoc* valuation is made periodically of all wealth held in individual ownership, and it is only required to ascertain what proportion of the whole comes thus under review in any given year, or, alternatively, at what intervals of time the same item of wealth will be re-charged to duty on the average, in order to compute the total wealth belonging to individuals. But this apparently simple task is, in practice, fraught with many difficulties, and the method of ascertainment of the "multiplier," though greatly improved of late years, is still open to doubt or enquiry upon important points. The question cannot possibly be opened up at length here, and those interested are referred to the considerable literature upon the subject, notably Sir Bernard Mallet's Paper given to this Society in 1915; Mr. G. H. Knibbs' work, *The Private Wealth of Australia*; Chapter XI of my *British Incomes*; and the monumental work by Corrado Gini to which reference has been made. Knibbs says there are two methods—(1) the determination of the average interval of time between the passing of estates to the successors in title, and (2) the ascertainment of the average rate of the passing of estates during any period under review. The first may appropriately be called the *devolution-interval* method, and the second the *devolution-rate* method. Obviously the two methods are—in the last analysis—essentially the same, the number of years in the devolution interval being the reciprocal of the annual rate of devolution. At first sight it might therefore appear that it is a matter of little moment which method we follow. This surmise is not correct; "the devolution interval method is the more complicated and uncertain, and the corrections—which must be applied to any estimate of its value—are not readily computed or easily "ascertained." Gini, however, makes some subtle distinctions, and elaborates several variations with different titles.

The chief difficulties of all devices for using Probate Returns arise through:—

1. Defects in administration and evasion of the particular duty, the statistics of which are being used.

2. The effect of gifts *inter vivos*, in keeping a certain proportion of wealth from "passing" with the frequency of ordinary intervals for estates as a whole.

3. Legal points in the Estate Duties, *e.g.*, the practice of settlements, and settlement Estate Duty.

4. The fact that vital statistics are continually changing.

5. The application and sufficiency of vital statistics, *e.g.*, the variations between the death rates for the different ages, classes of people, and the two sexes, in relation to the wealth held in each class.

6. The actual growth of wealth in the period under review.

Even when these difficulties are overcome, the result is an aggregate of *individual* wealth only, and additions have to be made for wealth which may not be fully reflected in individual holdings (reserves of public companies) and for social, corporate or national wealth. The method would have the advantage over the method of capitalisation of income, in that it measures the value of non-income producing wealth, such as furniture, pictures and jewellery, but this advantage is considerably reduced in practice, for such wealth is frequently "passed" during lifetime, and is often not fully valued.

The method has long been the favourite one in France, and it has also been studied and used in the United Kingdom, Italy, Australia, and to a less extent elsewhere. It has almost invariably given lower results than the other methods.

(*b*) *Statistics of Capital Valuations for Specific Purposes.*—The special valuation of land for the Land Values Duties furnishes an example. From this point of view these statistics are partial and auxiliary only, and nothing short of a complete and universal valuation—as under proposals for a capital levy—could furnish statistics adequate for an estimate of national wealth. Even in this case there is a large sum that must be called "national wealth" that would not be included in the aggregated individual fortunes.

IV.—The Inventory Method.

This method aims at a valuation, in the aggregate, of each "form" in which wealth is embodied, without regard to the ownership by individuals, companies, &c. It is often called the "objective" method. It depends for its success almost entirely upon the existence of statistical material compiled for other purposes, *e.g.*, import and export statistics, local government taxation figures, expert valuations of mineral resources, statistical enumerations of objects to which an average value can be applied. Examples of the last mentioned are the valuation of shipping by reference to the total tonnage multiplied by an average value per ton, or of mining capital by the average capital invested per ton of output; or of live stock by the number of each kind multiplied by an average price; or even of businesses, by a co-efficient. There are few classes of statistics that have not been pressed or even "hammered" into service for the "inventory" method, and further illustration can best be left to the paragraphs that follow.

The chief defects of the method are:—

1. The impossibility of testing how far the ownership of the wealth is within the country or not. It is obvious, for example,

that if half the farms in a country are mortgaged to or owned by foreigners, their value will give a false impression of national wealth.

2. The difficulty of determining whether all forms have been included.

3. The risk of overlapping, *i.e.*, stocks and shares duplicated with real property, owned by companies.

4. The divorce from all tests of profit earning capacity. For example, the carriages, railway lines, stations, &c., of a railway company are all "valued," and their aggregate comes to, say, 5,000,000*l*. The railway as a whole may have been losing money for years, or, on the other hand, may be making several millions a year.

Of course, as a general rule on capitalisation of plus and minus "goodwill" (in the excess or deficiency of profits compared with the normal return upon invested capital), the differences tend to cancel out, and an aggregate of valuations as "going concerns" tends to approximate to invested capital, except when there are striking changes in the value of money and rate of interest.

5. The difficulty, where "averages" are employed as factors, of accurately determining them. If they are the results of impressions, they may be considerably in error, and even if they are the product of actual observation they have often to be carefully weighted in application to the different classes.

It is rarely that a "sample" can be taken which can be regarded as identical in proportionate components with the whole. Average "wage" statistics can be applied only after close study of the data.

The Inventory method may be carried through by single observers, as in France, Germany, Spain, Australia, Argentine, and other countries, or it may be the collected results of many investigators, as with the United States, where it is called a "Census."

An auxiliary or alternative method to the Inventory, but really falling under that title, is the "Fire Insurance" method (as applied in Germany) which of course is very rough, and covers only a part of the field.

V.—The "Census" Method.

In the Census proper a statement is taken from each individual resident declaring the whole of his wealth and income. This method has been followed in Australia, and is described with some elaboration and much important new analysis by Mr. G. H. Knibbs. It has the disadvantage of course that individuals may have very different ideas of capitalising their income, or of estimating market values; that some may be afraid of the use of the Census for taxation purposes; and that there may be omissions to make the return. In any case, additions have to be made for collective wealth. But it is the only method which enables direct correlation between wealth and income to be examined. From such an examination Mr. Knibbs has obtained the "wealth-and-income" or "pluto-prosodic" surface.

The chief methods of determining National Income follow to some extent similar lines.

1. *Statistics of Income Taxation.*—The value of this method depends on the completeness and efficiency of the tax in question. It is, for example, very different if England is compared with Italy. "Taxation at the Source" obviously gives more complete figures, requiring less supplementing from other sources.

The extent to which this method covers the field depends upon the exemption limit, or the point at which the tax starts. The Prussian limit of 47*l.* per annum enabled the method to be applied to cover the bulk of the population, but the British limit of 160*l.* did not account for as much as one-half of the total income, or more than one-eighth of the people. The American exemption, still higher, left an even greater proportion to be dealt with by other means. But with all its defects, this method is the only really satisfactory one for dealing with the income of the wealthier section of the community.

2. *The Occupational Census Method.*—This method is used for dealing with the wage earning classes and smaller incomes where the income tax statistics do not apply. These classes have little income beyond their earnings, and the average earnings of each class are determined as closely as may be, and applied to the number of earners in each class or occupation as given by the Census. The whole value of this method depends, of course, on the accuracy of the census, and still more upon the care with which wage statistics are prepared and handled. The lower half of the British estimate is determined in this way with very satisfactory material. The same method is adopted for France, but, by the application of averaged earnings, the result is obtained on rougher lines. In France, moreover, the method is applied to businesses and professions in the absence of income tax statistics.

3. *Interest on Capital.*—In a few cases estimates are partly made up, or are checked, by a computation of the average yield upon different classes of capital to the amount of such capital determined in other ways.

4. "*Net Output*" *or Census of Production Method.*—If the total value of work done or goods produced in a year is determined and

the values of the raw materials used are deducted, the "added "value" may be taken to be the fund which forms the people's income. In the British Census of Production, 1907, the "Net "Output" was the gross output (selling value) less the cost of materials used. "It expresses completely and without duplication "the total amount by which the value (at works) of the products "of the industry taken as a whole, exceeded the cost (at works) "of the materials purchased from outside, *i.e.*, it represents the "value added to the materials in the course of manufacture." It corresponds, *approximately*, to the balance of a trading account. It constitutes for any industry the fund from which wages, salaries, rent, royalties and sundry expenses have to be defrayed, the balance being profit (or loss). Mr. Flux showed that the results of the 1907 Census were consistent with the estimates of British income obtained in other ways. Giffen, in 1903, made an estimate by aggregating the value of goods consumed. This method has hitherto been the chief one for the determination of the incomes of the United States.

5. *The Income "Census."*— This method has been adopted in Australia for 1914-15 at the same time as the Wealth Census referred to above.

5. THE UNITED KINGDOM.

I do not propose to devote a great deal of my space to the estimates of our own national wealth and income because the literature on the subject is readily available, and the methods and data are better known and understood than those for other countries.

The most recent detailed estimates of capital are those given by Mr. Crammond before this Society in 1914, 16,472,000,000*l.*, and my own in *British Incomes and Property* (published in 1916), for 1914, of 14,319,000,000*l.* ± 1,867,000,000*l.* The latter was re-examined in 1918 in the *Economic Journal*, in connection with the proposals for a capital levy which had brought forth a crop of "estimates" widely divergent. The former was repeated by Mr. Crammond recently without re-examination.

The estimates by Sir Bernard Mallet and Mr. Strutt, given to this Society in 1915, based on the "multiplier," led to a considerably lower figure than my estimate. For convenience I reproduce below, from *British Incomes*, the main headings of the valuation (which has not to my knowledge been adversely criticised in any detail) and would refer those interested to Chapter XI of that book for further particulars :—

	Capital value (million £).
1. Lands	1,155
2. Houses, &c.	3,330
3. Other profits (Sch. A.)	22
4. Farmers' capital	340
5. Sch. C., National Debt, &c.	1,148
6. Railways in the United Kingdom	1,143
7. Railways out of the United Kingdom	655
8. Coal and other mines	179
9. Ironworks	37
10. Gasworks	182
11. Waterworks, canals, and other concerns (Sch. A.)	278
12. Indian, colonial, and foreign securities	621
13. Coupons	383
14. Other profits and interest	276
15. Businesses not otherwise detailed	2,770
16. Income accruing abroad and not remitted	400
17. Income of non-income tax paying classes derived from capital	200
18. Movable property, &c., not yielding income (furniture, &c.)	800
19. Government and local property	400
Total valuation	14,319
or, in round figures	14,300

At the time when Mr. Crammond gave his estimate of 16,472 millions, I criticised some of his details, and I find that he remarked that my criticism was "very valuable" and that he was "glad to "accept" the corrections. In setting out my own results subsequently, I continued the analysis of his details. But in view of his recent use of the original figure as the estimate for 1914, and of the fact that it has been widely published and quoted, and diverges so widely from my own, it is perhaps only right that I should indicate wherein the main divergence lies. For "Lands" my estimate is 150 millions less, for "Companies and Trades" generally it is nearly 900 millions less, though for a specially selected group it is 200 millions more. In the case of his capitalization of the income of non-taxpaying classes derived from capital, Mr. Crammond has put 1,000 millions against my 200 millions, because he has quite confused this old entry of Giffen's with the *full* capital of the lower classes, and has ignored the extent to which the *gross* figures for income tax already capitalized by him in his remaining figures cover the ground. His figure for capital in investments abroad on which income is not brought home, was 500 millions more, and his figure for movable property 200 millions more. Except as to the last item, which is merely a matter of individual judgment, I remain of opinion that the best evidence supports my figures rather than his; that he has not made himself sufficiently acquainted with the character of the original data, and that his aggregate estimate is far too high. He gave the wealth per head in Germany as 227*l.* against a British average of 336*l.* His methods lead to appreciably higher figures than those arrived at by Sir Leo Chiozza Money in "Riches and Poverty" or in "The Nation's Wealth."

In the *Economic Journal* for September, 1918 ("An estimate "of the capital wealth of the United Kingdom in private hands"), I have shown that the national wealth, as estimated by the multiplier upon the data supplied through individual returns of wealth, is reconcilable with the estimate that *would be made* on the Giffen (or capitalization of income) basis with our *existing* income tax figures, if we had similar taxation on *individual statements of income* and not taxation at the source. That is to say, the gap between the old estimate by the capitalization method and the estimate by the "multiplier" estate duty method is not substantially greater than the gap between the capitalization method for income tax *assessments* at the source, and the capitalization of income admitted on personal statements for super-tax, abatements, &c., in the same scheme of taxation for the same year. I also checked the estimate in *British Incomes* in sections by reference to the results of the new Land Valuation, the Census of Production, and the capital invested abroad, and I concluded that there was no evidence to justify any substantial additions. I therefore remain of the opinion that 15,000,000,000*l.* was an outside figure for the year in question for the total national wealth, of which upwards of 3,000,000,000*l.* would not have been returnable by individuals in statements of wealth for the purposes of a capital levy.

The Estimate of Income is generally made up of three parts:—

(*a*) The income of income tax paying classes, from the tax statistics.

(*b*) The income of wage-earning classes.

(*c*) The income of others below the income tax limit (made the subject of a special enquiry by the British Association a few years ago).

Dr. Bowley has so recently reconsidered these factors that I cannot do better than repeat his conclusions.[1]

The section under (*a*) was carefully considered by me in *British Incomes*, and he has accepted all my conclusions. The summary is:—

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[1] "The Division of the Product of Industry—an analysis of National Income before the War."

	Million £.
Wages, small salaries, &c.	1,046
Incomes over 160*l.*	936
Miscellaneous	108
	2,090 for 1911,

and on similar lines rather over 2,250,000,000*l.* for 1913-14. He concludes, "I am unable to obtain the figure of 2,400,000,000*l.* "frequently stated as the pre-war income without making "extravagant estimates of wages or of incomes from abroad." The totals arrived at on these principles for 1907 were reconciled with the results of the Census of Production by Mr. Flux on the "Net Produce" method; and they have also, very roughly, been shown to be consistent with the annual values of residences, and the gradation of wealth indicated by the House Duty statistics. At an earlier date (1903) Giffen obtained a figure from "total con-"sumption" which tallied with the direct results.

I think that on the whole the estimate of income, having regard to the nature of the data and the methods employed, is perhaps the most accurate available for any country, and is certainly in Grade I. My estimate for capital taken alone would have been placed in Grade II, but, in view of the consilience of other lines of evidence, it is fairly safe to say that the range of error is not greater than 10 per cent., though it certainly cannot be affirmed to be much less.

6. The United States of America (excluding Alaska and the Island Possessions).

The fountain head of practically all information on the subject of American wealth is the "Census" conducted by the Washington Bureau. The first census was in 1850, and it was repeated at decennial intervals down to 1900, and then taken in 1904 and 1912. The latest figures for the purposes of this Paper are taken from the *Bulletin of Estimated Valuation of National Wealth*, dated March 10, 1915, which gives the statistics for 1912. A comprehensive work, *The Wealth and Income of the People of the United States*, by Dr. King, of Wisconsin University, deals very lucidly with the results of the censuses from 1850 to 1904, and can hardly be improved upon as a fair and critical review of the material presented in a broad and popular way. Other monographs exist in fair numbers, but they are practically superseded by this work. In his judgment the earlier census estimates were only broadly representative of the facts, but in the recent ones we may accept the results with "a very "considerable degree of confidence," for there has been progressive improvement in the methods adopted by the Government Departments and in the quality of the statistical material. An interesting summary of the results may also be read in *The Private Wealth of Australia*, by G. H. Knibbs, published in 1918.

Capital.—Although the American method is called a "Census," it is more strictly an inventory, as far as possible on a tax basis, for it does not require individual statements of personal wealth, but delegates the construction of the inventory to a large number of officials for different areas, under careful uniform instructions. Thus it has advantages over an inventory compiled by a single statistician working for the whole country at once, for it works in detailed touch with all local conditions and variations, and thus obviates the risks attaching to averages, or even to weighted averages. But, on the other hand. there is always difficulty in getting a number of investigators to act upon a strictly uniform principle. The American Census has always been very dependent upon the data furnished by its system of taxation, and therefore belongs just as much to the estimates under the taxation class as others which have never been dignified by the name of "census," and it is clearly in a different category from the Australian Census. The accuracy of the valuation for the general property tax has always been a critical point, practically dominating the whole estimate. In 1850 the officials were asked to state the true valuation as well as the assessed valuation, by adding a percentage to the latter. The proper percentage to add was certainly not acknowledged or known at that early date. A similar instruction was given in 1860. In both these years property belonging to foreign residents was included and State property omitted. The 1870 Report claimed that the addition to compensate for under-assessment had been made with great nicety by competent investigators, but admitted that nothing more than an "impression" could be given of the amounts of personal property omitted from assessment. The valuation was then $24,055,000,000, or 4,940,000,000*l.* on a gold basis. In 1880 the attempt at correction was very elaborate, and from enquiries in many directions it was determined that assessed values were, as a whole, 65 per cent. of true values; but the Acts of 1899 and 1902 (resulting in the censuses of 1900 and 1904) were efforts to place the investigation on a still firmer footing. Franchise properties like railways and tramways were valued by a capitalization of net earnings; ships were taken on building costs written down for depreciation; mines were valued on the survey reports, while personal property was taken on four years' national purchases, checked by a method of sampling individual households, and their insurance policies.

In 1912 the following points are of interest:—Taxable real property was considered to be assessed at 11·7 per cent. of its value in Iowa, and 15 per cent. in Nebraska, as against 100 per cent. in New Hampshire and Wyoming. The exempt property was taken as a proportion (one-eighth) on the sample of the three States for which it was separately given. Livestock and agricultural products were valued according to the official returns from the Board of Agriculture, and on the results of previous censuses; gold and silver coin and bullion, railroad and equipments, cars, &c., shipping and canals, mining products, &c., were similarly estimated from appropriate official reports. For manufacturing machinery, tools, &c., the proportions ascertained in 1904 were adopted. Tramways, telephones, electric light and power, were taken at the cost of construction. The valuations of manufactured products were based upon previous censuses, and it was assumed that one-twelfth of the value of foodstuffs, and one half of the value of other products were in merchants' stock, and that there was a two months' supply of factory materials in stock. A six months' stock of imports was assumed, while furniture and similar movables were taken as the products and imports of the period from 1904 to 1912, added to 20 per cent. of the 1904 value, and light articles (such as kitchen utensils) were estimated at a year's product. The following table in sterling is taken, in an abridged form, from G. H. Knibbs' work:—

Form of wealth.	In million £.		
	1900.	1904.	1912.
(*a*) Real property taxed	9,519	11,405	20,212
(*b*) ,, ,, exempt	1,277	1,404	2,533
(*c*) Livestock, farm implements, &c.	833	1,011	1,563
(*d*) Gold and silver coin, &c.	345	411	538
(*e*) Railways, Pullman cars, &c.	1,877	2,336	3,343
(*f*) Tramways....	324	456	944
(*g*) Telegraphs and telephones	125	167	286
(*h*) Shipping, canals, irrigation	111	174	380
(*i*) Privately owned waterworks, electric light and power	138	173	491
(*j*) Agricultural products	299	390	1,076
(*k*) Manufactured products	1,250	1,522	3,019
(*l*) Mining products	67	84	167
(*m*) Imported merchandise	87	102	170
(*n*) Manufacturing machinery	522	678	1,252
(*o*) Clothing, ornaments, furniture, &c.	411	514	882
Total National wealth .	18,188	22,008	38,577
Population	75,994,575	82,466.551	95,410,503
National wealth per head of population	239*l.*	267*l.*	404*l.*

Year.	Money value of the economic goods possessed by the people of the Continental U.S. in £.	"Active capital."										"Consumption goods."		
		Year.	Total "Active capital."	Business buildings and fixed machinery	Rail-ways.	Other public utilities.	Movable machinery, tools, implements.	Live-stock.	Farms.	*Per capita* value of active capital.	*Per capita* value after adjustment by price index.	Total.	Value *per capita.*	Value *per capita* after adjustment by price index.
	Mill. £.		Mill. £.	Mill. £.	Mill. £.	Mill. £.	Mill. £.	Mill. £.	Mill. £.			Mill. £.		
1850....	1,466	1850	566	229	94	37	82	123	1	24½	17	476	20	15
1860....	3,320	1860	1,212	444	317	66	127	246	2	39	27	862	27	19
1870....	6,160	1870	1,845	611	548	90	248	345	2	48	22	1,226	32	14
1880....	8,968	1880	2,802	846	967	140	488	356	5	56	42	1,983	39	30
1890....	13,365	1890	3,965	1,171	1,448	270	548	521	6	63	55½	3,132	50	44
1900....	18,188	1900	5,092	1,490	1,578	667	823	657	7	67	66	4,280	56	55
1904....	22,008	1910	9,856	2,733	2,795	1,997	1,232	1,090	10	107	85	6,776	74	58

After considering carefully the data and the method of valuation for 1912, my own impression is that a range of possible error of ± 5 per cent. should be assigned to (*d*), a range of ± 7½ per cent. to (*a*), (*e*) and (*h*), of 10 per cent. to (*c*), (*f*), (*g*), (*i*), of 20 per cent. to (*b*), (*j*), (*l*), (*m*), and of 30 per cent. to (*k*), (*n*) and (*o*).

The net effect of these estimates is a range of possible error over all of ± 13 per cent. Although it is extremely improbable that all the errors could be in the same direction, and it is therefore likely that the net error must on this showing be much less than 13 per cent., I do not feel that the estimate can properly be put into the first grade. It is difficult to judge whether, if all profits were capitalised, the plus and minus goodwill would so balance as to leave the result practically equivalent to this inventory of hard assets, and I am never completely reconciled to any valuation which ignores the valuation as a "going concern," on the actual earning power of the separate aggregations of assets. A few of the above items have been valued on this basis, but only a small part of the whole has real relation to current earning power.

The table on the previous page is made up from various sections of Dr. King's book.

It may be mentioned that the French writer, Neymarck, adopted an estimate of 25,900 millions for 1913. Rising land values constitute a growing fraction of the nominal increase of wealth, for in 1850-60 they were one-third only, and in 1900-1910 three-fifths of the increase is for higher land values.

Income.—Dr. King says that "with existing data" it is difficult, if not impossible, to estimate with great accuracy, the total value of the national income. He considers that it can be attempted in two ways:—(1) the consumption of the people, and (2) the production of the nation. As regards (1) there is little information on retail prices, and it is difficult to avoid duplicating items, for there is much "consumption" that takes place for further production, so that (2) is the more workable. He tried the method of multiplying the book income of families by the number of families in the class, and also tracing the process of production from nature to the final consumer, and found that for 1910 the totals were not greatly different, but the second process necessitated less guessing than the other. The following table shows the chief results:—

United States National Income.

Year.	Total money income.	*Per capita.*	Corrected for price.	Per family.	Price	Total estimate capital savings	Net goods consumed.
	Mill. £.	£	£	£	£	Mill. £.	Mill. £.
1850....	455	19	14	110	79	82	373
1860....	747	24	16	126	89	173	574
1870....	1,380	36	16	183	82	215	1,165
1880....	1,519	30	22	151	114	260	1,259
1890....	2,482	39	35	193	170	330	2,152
1900....	3,693	49	48	228	224	322	3,371
1910....	6,272	68	54	307	243	411	5,861

Dr. King considers that the error in 1850 may be at least 25 per cent., but that the years 1900 and 1910 are correct within 10 per cent. Spahr's work was the chief authority for prior years, and it gives 2,220,000,000*l.* for 1890, or 11 per cent. less than King. As the estimate stands, unchecked by any taxation data, it is in the second grade, but after the lapse of a few years such statistics should be available from the recently instituted income tax as to make a much closer estimate possible. The early years of a new tax never give complete and reliable statistics of wealth, but the details published in 1918, for 1916, by the Treasury, so far as can be seen, lend support to Dr. King's work. The exemption limit is high, and much careful work by investigators with first hand knowledge of the material is necessary to render real assistance upon the problem.

A recent writer[1] has made a computation for 1917 and 1918 on the income of the United States as a whole, and as subject to excess profits and income taxation. He adopts the same method as Dr King, who gave nearly 6,275 millions for 1910. The Hon. A. C. Miller, of the Federal Reserve Board, put the income for 1917 at rather more than 10,000 millions.[2] Professor B. M. Anderson, of Harvard, put the figure as high as 14,000 million.[3] for 1917, by adopting King's 1910 basis and adding 31 per cent. for increased production and 71 per cent. for increase in prices. Mr. Friday's own estimate is 13,400 millions, obtained by the "net product" method, which may be said, despite the enormous inflation and the difficulty of handling the figures consequent thereon, to confirm King's work. The point to be considered here is the extent to which

[1] David Friday, "The Taxable Increase of the United States," *Journal of Political Economy*, December, 1918.

[2] "War Finance and Inflation," *Annals of the American Academy of Political Science*, January, 1918.

[3] *New York Times Annalist*, January, 1918.

the 1917 figure is confirmed by the income tax data for 1917, after detailed consideration. He finds that the total income subject to tax was nearly 3,700,000,000*l.*, but he is not able to relate this to the *total* income for the year. All that can be said is that the ratio of increase in taxable income from 1913 to 1917 is roughly comparable with the ratio given by the net product method. Probably when the definite comparison between the results of the two methods comes to be attempted it will be found that the American individual income returns suffer in the same way, statistically, as our own. They will quite fail to exhaust the share of the total income (as taxed at the source) assignable to the classes concerned. Dr. R. P. Faulkner has stated that out of $2,000,000,000 of dividend income, super-tax methods account for only $491,000,000.[1]

7. THE GERMAN EMPIRE.

The most frequently quoted source of information for Germany is the work entitled *Deutschlands Volkswohlstand*, 1888–1913, by Dr. Helfferich, Director of the Deutsche Bank, published in 1913. It represents a clear and able attempt to get a close approximation to the aggregate income and capital. The estimate for national income is based upon the Prussian income tax returns for 1912, on the following lines :—

	Million £.
1. Net total incomes of taxpayers with incomes of over 3,000 marks	326
2. Taxable incomes of taxpayers with incomes between 900 and 3,000 marks, calculated from the arithmetical average of the taxes paid by various classes within this group	421
3. Income of certain exempted persons on an average of 1,500 marks	46
4. Incomes of tax free individuals and heads of households, assuming a minimum average income of 750 marks	299
Total income of personal taxpayers and persons exempt	1,092

The corresponding totals for earlier years were :—

	Million £.
1896	629
1901	752
1906	855
1911	1,058

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[1] *Journal of American Statistical Association*, 1914, page 521, "Income Tax Statistics."

An addition is then made for income tax evasion amounting to 10 per cent., which is the estimate given by "most authorities." As only the *dividends* of companies appear in personal returns, the undistributed profits or reserves are then estimated on the basis of *one-fourth* of the income assessed for impersonal taxpayers, or nearly 11,000,000*l.*, bringing the Prussian aggregate income up to about 175,000,000*l.*, an "average income of 600 marks per caput."

Dr. Helfferich then declares that a "thorough examination of "the assessment results" (Durchprüfung der Ergebnisse der Veranlagung) "in the other States having an income tax system suitable "for purposes of comparison, shows that this average may be taken "as representing, approximately (ungefähr zutreffendes Mittel) "the average income for the whole Empire. In Saxony the average "is rather higher, in Wurttemburg and Baden somewhat lower, in "the Hansa cities—with an average of nearly 1,000 marks—considerably higher, and in the relatively poor Thuringian States "considerably lower." Applying the Prussian average to the whole Empire (with its population of about 66 millions) he gives a grand total of private incomes of 1,910,000,000*l.* to 1,960,000,000*l.*, to which he adds 50,000,000*l.* for the net incomes of public corporations, Federated States, Revenues, making in all 1,960,000,000*l.* to 2,010,000,000*l.* His calculation for 1896 on similar lines comes out at 1,050,000,000*l.*, or 410 marks per caput, so that there was an increase of 80 per cent. in aggregate, and 45 per cent. in individual income. Helfferich says: "the modest character (Wie "mässig) of the estimate is seen by comparison with Schmoller's "estimate for 1895 of 1,225,000,000*l.*, which, on the same "basis of increase, would amount for 1911 to 2,200,000,000*l.*" Helfferich omits to note that if he had allowed a wider margin for income tax evasion in 1896 than in 1912—which by all the literature upon the subject is clearly proper—then his own estimate for 1896 is too low, and approximates more closely to Schmoller's figure, while the operation of raising the latter to the 1911 basis is not justified. He considers that Steinmann-Bucher's estimate of 1,710,000,000*l.* for 1908 agrees substantially (in ungefährer Uebereinstimmung) with his results.

In a fifth edition (1915) of his book, translated into French, Helfferich says that no fresh statistics are available, and for 1913 he makes a "trifling" increase of 120 millions, bringing the total to 43 milliards of marks, or 2,105 millions sterling.

On a critical review of Helfferich's data and methods, I conclude:—

(*a*) That there may be 5 per cent. error in the estimate of tax free incomes either way.

(*b*) That the 10 per cent. addition for evasion is a minimum figure, and that the figure may possibly be even 20 per cent. The comparison between the supertax and abatement statistics, and the income tax at the source in the United Kingdom, which I made in the *Economic Journal* in September, 1918, is an instructive analogy on the possible extent of this margin. But in applying it to these figures, I have allowed for the corporate income under "*c*."

The introduction of the "amnesty" provision in the 1913 law, as well as the remarks of candid critics of the German administration, indicate that the loss due to evasion may well exceed 10 per cent. The Prussian system is admittedly strict in its scrutiny of the accuracy of items *revealed*, and also of the presumptive agreement of the aggregate income with the style of living, but there was no exhaustive method of referring all objective sources of income in detail to individual dossiers.

(*c*) The addition for company reserves cannot well be more than 25 per cent. below the figure given, but may easily be 50 per cent. above it.

(*d*) The use of the Prussian income per head as the basis for computing the incomes of the rest of the Empire is not invalidated by any *prima facie* improbability as to its correctness, though at that date the absence of any reliable comparison for such a large State as Bavaria is an important source of difficulty. It seems, at any rate, possible that the average for the whole Empire might differ from that for Prussia by 5 per cent., or, at any rate, that the non-Prussian States might differ from Prussia by 10 per cent.

(*e*) In the estimate of public property an error of 30 per cent. is possible.

The net result of these considerations is that Helfferich's mean estimate of 1,985,000,000*l.* may possibly be excessive by 111,000,000*l.* or deficient by 184,000,000*l.*, or say 6 and 9 per cent. respectively, so that it may be classed as a Grade I estimate.

Capital.—Helfferich takes the statistics of the Property tax in Prussia for 1911 as his starting point at an aggregate valuation of 5,100,000,000.

He adds :—

	Million £.
1. For taxable property omitted, 20 per cent.	1,020
2. Private property legally exempt. (Properties under 300*l.* are tax free and those between 300*l.* and 1,000*l.* are free if the owner has less than 45*l.* per annum) 5,400,000 owners at an average of 122*l.* and 240,000 at an average of 392*l.*	758
3. Furniture, utensils, clothing, &c., 10 per cent. of (1) and (2) above (17*l.* per head)	735
4. Property in impersonal ownership....	245

The aggregate thus becomes 7,850,000,000*l.*, or about 196*l.* per head in Prussia, and, on the assumption of a like basis for the other states, 12,750,000,000*l.* for the Empire.

He then adds the State railways, which represent 835 millions of invested capital, but which were worth, in his judgment 1,000,000,000*l.* to 1,250,000,000*l.*; the profit making concerns belonging to State and municipalities, and further corporations, about 125 millions; schools, churches, parks and similar unproductive property, with military and naval works, from 125,000,000*l.* to 150,000,000*l.* From the last two classes falls to be deducted the public debts about 125,000,000*l.* The grand net total is 13,950,000,000*l.* for 1911.

Helfferich proceeds to check this by reference to fire insurance statistics for 1911:—

	Million £.
Insured values in public institutions	3,890
,, ,, joint stock companies	6,060
,, ,, mutual associations	880
Total	10,830

Insurance of German property in foreign companies is not included, and no allowance is made for insufficient insurance or self-insurance, and Helfferich concludes that the aggregate value of real and personal property cannot be *less* than 10,000,000,000*l.* The value of land, as distinct from buildings, has been variously estimated from 1,000,000,000*l.* to Steinmann-Bucher's figure (approx.) 2,500,000,000*l.* Helfferich assumes an average of 80*l.* to 100*l.* per square rod for city areas, and arrives at 1,470,000,000*l.* An average value of 40*l.* per hectare for agriculture and forests, gives nearly 2,000,000,000*l.* more. The last item in his estimate, which he considers to be the most uncertain of all, is that for foreign investments. The Imperial Marine office in 1905 gave 400,000,000*l.* to 450,000,000*l.* as the capital *investments* abroad. The German holdings of foreign securities were put at 500,000,000*l.* in 1892 by Schmoller, and at 600,000,000*l.* in 1893 by the President of the Reichsbank; at 800,000,000*l.* in 1905 by the Marine Office. These two classes of capital overlap, and cannot be added together. Helfferich adopts 1,000,000,000*l.* after allowing for this, and for the securities sold back to foreign countries, and considers it, if anything, too *high*. His whole table is as follows:—

		Million £.
Real and personal property insured against fire	nearly	10,000
Land in Country and City	,,	3,500
Mining property....	,,	300
Shipping	,,	50
Goods in transit....	,,	50
Metallic money	,,	200
Public property, including railways, not insured against fire	,,	1,500
Capital investments abroad	,,	1,000
Total	net	16,420

The tax method, therefore, gives a result of 13,950,000,000*l.*, and the fire insurance method 16,420,000,000*l.*, from which Helfferich derives his final figure of 14,750,000,000*l.*, with these as the limits of possibility. Examining the first method in detail and assigning a margin of error to each item, it seems to me that the preliminary aggregate of 7,850,000,000*l.* may be too much by 200 million and too little by 1,270,000,000*l.*, and the whole Empire (12,750,000,000*l.*), therefore 300 millions and 1,900 millions respectively, if the proportion is identical, as assumed. But there may be an error of at least 10 per cent. in the application of this proportion, and of 20 per cent. in the further items, bringing the range of possible error up to—1,030,000,000*l.* and +2,630,000,000*l.* respectively.

Judged by this method alone, therefore, the estimate would range between 12,920,000,000*l.* and 16,580,000,000*l.* And all that can be said about the fire insurance method, which contains no elements with a less range of possible error than 20 per cent., is that it tends to the adoption of a figure nearer the upper limit. At any rate, it would justify one in taking, at least, the mid-point between the two limits, and putting the valuation at 15,550,000,000*l.* Altogether, I am of opinion that Helfferich's estimate is too low by at least 800,000,000*l.*, and that, despite the use of two independent methods, it cannot be classed as Grade I.

Helfferich then also looks at Schmoller's estimate of (approx.) 10,000,000,000*l.* for 1895, and brings it up to 1911 by taking the mean of the percentage increases in property tax figures and fire insurance figures respectively (after deducting one-fourth for more complete insurance and more rigid assessment). This gives rather over 15,000 millions, but is, of course, of little value. The wealth per head is given as 226*l.* to 240*l.* Helfferich deals in detail with the yearly increase of national wealth, and measures it by various tests, from which we may assume an annual figure at 1912 of 500,000,000*l.*, to be closely approximate to the truth. His 1911 figure would therefore be 15,750,000,000*l.* and my own modification, as suggested, 16,550,000,000*l.*

It must be borne in mind in connection with statements—generally unaccompanied by any data which can form the object of criticism and examination—placing the capital vaguely in the neighbourhood of 20,000 millions, that ulterior motives were particularly likely to exist in German propaganda, and that too much credence can easily be given to vague estimates. Even Helfferich had it in his mind to make out as strong a case as he could, and the tone of his first edition is further exaggerated in the more recent editions (1915). He said, "We are no longer at the mercy of "borrowed capital, nor is a financial blockade possible, since the "days of the Morocco and Tripoli and the Balkan crisis. We built "our fleet and increased our army without having recourse to a loan "for the purpose, and moreover devoted an equal sum to workmen's "insurance, a feat unparalleled elsewhere, and we have repaid foreign "loans. The results of the war have so far justified all we expected "from Germany's economic and financial preparations." (N.B.—The word used is "Rüstung," a term rarely employed in the German language otherwise than for military preparations.) "A few weeks "before the outbreak of the war we regarded it as a matter of "world-wide importance to dispel the illusion that financial tactics "could secure what hitherto neither military power, nor alliances, "nor ententes, could bring about, namely, the destruction of "Germany, and we may consequently hope that the future course "of the war will eradicate the illusion once for all and show the world "that Germany is equal to any rival. Whosoever fails to destroy us "by steel and iron need not hope for salvation from the British "Chancellor's 'silver bullets.' In order to maintain the conquered "lands and secure further territory, we must learn from the mistakes "of others."[1]

The editor of the journal from which the above is cited, goes on to remark that previously it could only be conjectured what motives gave rise to the publication and gratuitous distribution of the book, but that now the reasons are abundantly clear. With such an object it can hardly be supposed that Helfferich would knowingly have neglected any opportunity for stating the national wealth as fully as could plausibly be supported by evidence. As a French writer has recently said concerning German estimates, "their "authors have not usually been either modest or moderate." Professor Ballod has made a recent attempt on the following lines:

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[1] *Stock Exchange Gazette*, January 9, 1919.

	Million £ (approx.).
Rural property, built and unbuilt	3,900
Urban	3,600
Shares	1,750
Public debt	1,750
Foreign property	1,230
Private industry	720
Trading stocks	500
Various public debts	4,450
State debts	1,000
	18,900
Deductions: foreign holdings, &c.	2,000
	16,900
"Increase" in rural property since 1914	1,000
	17,900

or in round figures, 18,000 millions.

He admitted that this total bore traces of inflation, and that after the war the values would shrink, but he was considering the immediate fiscal position and the basis of taxation. In my judgment his estimate does nothing to disturb the approximations already reached on Helfferich's basis.

The most notable recent contribution is that by Steinmann-Bucher[1], who had reached 17,130 millions for 1908, which Helfferich definitely regarded as too high. The Dresdner Bank, which had already fathered the boastful computations in 1913, took to re-assuring the German people when the war was well advanced, and Steinmann-Bucher "responsible Editor of information for the War "Commission of German industry," did not hesitate to declare at Easter, 1916 (in *Deutschlands Volksvermögen im Krieg*) that Germany "was rich before the war, is still more so during the war, and will "be even richer after the war!" and under the sponsorship of two Professors—Schantz and Julius Wolf—his doctrine was promulgated with profusion of publication throughout the Empire. He insists that when an objective total of market value has been reached, one has only begun the tale of national wealth—there are other elements not to be so measured. "I mean also the ability to acquire "wealth, to conserve and increase it, for this very faculty is in itself "riches." We must consider quality as well as quantity.

For 1914 he reaches 18,800,000,000*l.* to 19,850,000,000*l.* In several items he agrees with Helfferich's inventory, and the main differences arise through taking "real and personal property

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[1] *Vide* also *Das reiche Deutschland—ein Wehrbeitrag*, March, 1914, and *350 Milliarden deutsches Volksvermögen*, 1909.

"assessed against fire" at 10,000,000,000*l.* to 11,000,000,000*l.*, or 1,000 millions more, and "land in country and city" at 5,000 millions instead of the 3,500 millions adopted by Helfferich. Public property is put at 2,000 instead of 1,500 millions. His estimate of insured values does not seem to be free from the possibilities of double entries while, in dealing with the value of property he has preferred, as a basis, Prussian statistics of sale prices to the taxation rolls. The whole mentality of his work (and an apparent rivalry and jealousy between the two great banks) leads to the view that he would stretch every point to the utmost to prove his thesis. If we accept his figures we are faced with the fact that the boasted Prussian tax system, with all its bureaucratic and police accessories, must have been, in fact, ineffective to a degree, and I do not think the balance of evidence supports a higher figure than 17,000,000,000*l.* as the capital wealth of Germany in 1914, and I prefer the more conservative modification of Helfferich's methods, already given, viz., 16,550 millions.

The French writer, Péret, prefers an even lower estimate than Helfferich's own figure, for he considers the fire insurance statistics exaggerate the facts.

8. FRANCE.

The best work on the subject in recent years is a comprehensive treatment by René Pupin (*La Richesse de la France devant la Guerre*), published in 1916, while a briefer but useful summary of the data was made by Raoul Péret, Deputy, and former Minister of Commerce, the general reporter of the budget, in 1917.

In recent articles in *Économiste Européen* (February, 1918) E. Théry, author of "La fortune publique de la France" (1912), has made new computations of the capital wealth for 1912, following upon his estimates for 1892 and 1908.

Pupin expected to be criticized for arriving at figures in excess of previous investigators, but he is convinced that for many years the wealth of France has been underestimated. About 1906 to 1908 the "private wealth" had generally been put at 8,720,000,000*l.*, whereas Pupin, though regarding the total annual additions as 720,000,000*l.* only, reaches 11,300,000,000*l.* for 1911. In the same way the income had been put at 1,110,000,000*l.* to 1,190,000,000*l.*, and Pupin reached 1,430 millions. He claims to establish that the share of national dividend going to "capital" is clearly less than that going to "effort," that, taken together, they make 13 per cent. on capital, and that 10 per cent. of the annual income represents the net annual addition to capital.

Income.—Pupin recognizes four possible methods of estimation :

(1) That used by the Administration des Finances, viz., a coefficient giving a constant relation between rental values of premises and the incomes of their inhabitants.

(2) The computation of income from the amount of taxes paid.

(3) Classification of trades, &c., according to local areas, with a "co-efficient of productivity."

(4) "Successive approximations," as adopted by de Foville.

He employs the last, and seeks to find the "net income" or annual produce from capital and work which the French are able to dispose of after paying all general expenses of their enterprises. Basing upon the 1906 occupational census, he uses the average wages or earnings for each class or category. The Ministry of Agriculture furnished adequate data in 1913 (farm labourers, 45*l.*; women, 27*l.* ; male domestics, 40*l.* ; female domestics, 30*l.*, or an average over all of about 39*l.*).

His summary table of personal incomes is as follows :—

	Million £.	
From capital—		
Landed property	80	
Buildings	108	
Stocks and shares	176	
Savings bank, pensions, bank deposits, &c.	36	
		400
From effort—		
Agriculture (4,047,000 persons)	148	
Industry (6,215,000 persons)	277	
Commerce (1,437,000 persons)	58	
Professions (100,000 persons)	4·8	
Public officials (655,000 persons)	35	
Domestic service (946,000 persons)	38	
		560
Army and Navy (593,000 persons)		25
From capital and labour—		
Farming	132	
Commerce and private industry	148	
Liberal professions	33	
		313
Total income of all kinds		1,298
Deduct 10 per cent. from the income from shares for income from other sources already counted in this summary		18
Total of individual incomes		£1,280

Some important additions have to be made to this figure to bring it up to the "national" income in the ordinary sense :—

(1) 20 millions for undistributed company profits.

(2) 96 millions for *subsistence* of 4,800,000 persons living on the holdings of their farms at 493 francs per head, which can be increased to 140 millions when the whole families are included.

(3) 3·6 millions for land belonging to the State, the Départements and the Communes.

The income from landed property is based upon the estimates of capital values, together with the percentage ratios obtained by administrative investigations, and is unlikely to be in error by more than 5 per cent. An inquiry in 1909–10 gave a gross value for 133 millions for dwellings and 14 millions for factories, and Pupin deducts 25 per cent. from the former and 75 per cent. from the latter to get net values, with an addition of 4 per cent. from 1909 to 1911. The gross figure is probably correct within 5 per cent., but the deductions are extravagant, and I incline to the addition of 10 millions to his net result. Accepting the aggregate capital value average of stocks and shares adopted for the capital valuation, the return thereon was taken from various investigations at 4 per cent. This average is not a carefully weighted one, and may be in error by one quarter per cent., or one-sixteenth of the estimated return. The return from Savings Bank and other bank deposits is built up from various statistical sources under nine heads, and would err only by omissions; in fact, Pupin himself says "au total les "revenus de cette catégorie auraient largement dépassé 900 millions "en 1911; dans notre désir de demeurer plûtot en dedans de la "réalité, nous porterons ce dernier chiffre." The estimates of earnings and wages are based upon the occupational census of 1906, with an addition, small it is true, but adequate for French conditions, to bring the figures up to 1911. In agriculture the report of an official inquiry for 1910 (published 1913) by the Ministry of Agriculture, furnishes the required data, and the general average wage is 43*l.* for men and 28*l.* for women. Pupin's net figure, after a reduction for the slack season, makes no provision for value of board and lodging to farm hands living in, which would have been charged as an expense in arriving at the farmers' profits. It cannot be put at less than 6 millions. The possibility of error under the main heading is at least 10 per cent.

For wages in industry generally, Pupin has no scientific *ad hoc* data, but relies upon (*a*) the statistics for mines and quarries in 1905 (which show that 195,000 workers shared just over 10,000,000*l.* or about 52*l.* per head) putting his figures at 54*l.* per head for 1911; (*b*) investigations by Lavergne and Henry (1906) indicating for male workers 86*l.* in Paris and 49*l.* elsewhere, and for female workers 48*l.*

in Paris and 24*l.* elsewhere. These are weighted for the general average, increased by 3 per cent. for the further five years, and give 55*l.* per man (applied to 4,005,000 workers) and 29*l.* per woman (applied to 2,210,000 workers). A small reduction is made for 800,000 transport workers. It will be seen that the samples upon which the estimate is based are small and out of date, and it may well be that the result is 10 per cent. too high or 20 per cent. too low.

For commerce, examples are drawn from a branch bank, an "Établissement de crédit," and the result of "observations" in 1905 showing, for men, 74*l.* in Paris, and 40*l.* elsewhere, and for women, 40*l.* in Paris, and 24*l.* elsewhere. With an addition to bring the figures to 1911, it is 49*l.* throughout for men and 28*l.* for women, applied to 916,000 men and 521,000 women. The figures are so low that it does not appear possible the estimate can err in excess. Public officials are taken, after sample inquiry, at 60*l.* for State servants and 48*l.* for local officials, while the Army and Navy figures are closely known. Domestic servants are averaged at 40*l.* per head per annum.

The income from industry, &c., is taken under farming, commerce and professions respectively. The farming "net produce" is 36 millions, adopted from official statistics, and subjected to a comparison between 1892 and 1912 in the prices of produce and the level of expenses, and Pupin adds 96 millions for the remuneration of 5 million "farmers." Renoult in 1905 gave 12*l.* per head, but Lavergne and Henry, working upon Coste's details (for 1892) put it at 17*l.* 15*s.* There is a possible underestimate in this case of at least 10 per cent. In commerce and private industry the details are very meagre; 897,700 businesses from 1 to 50 workers each, or an average of 3, are assumed to make 160*l.* each; 180,000 establishments of a more modest character, without wage earners, are put at 80*l.* each. The professions are taken in detail, with estimated profits for each sub-class. As examples I may mention: doctors, 180*l.*; dentists, 120*l.*; veterinary surgeons, 120*l.*; teachers, professors, &c., 60*l.*; barristers (including the briefless), 60*l.*; artists and writers from 48*l.* for half the number up to 480*l.*, for the "aristocratic" 5 per cent. of the total number; engineers and architects, 120*l.* for heads of firms, and 60*l.* for assistants, &c. These averages all seem to be astonishingly low to English ideas, but it may be assumed that Pupin has not written without considerable knowledge of actual French conditions.

His actual gross total of 1,430,000,000*l.* may, in my judgment, be too much by 80 millions, or too little by 170 millions, and the estimate standing alone must be put in Grade II.

Péret's estimates for land and buildings, based on the administration of direct taxes, are the same within 2 millions; learned professions within 1 million.

For "commerce, industry, public functions and offices" (calculated by the method of "average relation" between the principal of the licence tax and the revenue of the professions in 1907) he gives 220 millions against Pupin's 173 millions, a difference which is largely counterbalanced by his 108 millions for "profit of agri-"culture" (based on the report of the Commission of Fiscal Legislation of the Chamber of Deputies, on the Income Tax proposal 1907), which is 24 millions less than Pupin's figure. Salaries, wages and pensions are put at 480 millions, and the income from personal property at 160 millions, making a gross total of 1,200,000,000*l.*, which, Péret himself says, is a "very low estimate."

Capital.—Pupin's valuation upon the direct method, as at the end of 1911, is given in the table on the next page, side by side with those by Péret and Théry (1912), in order that they may be compared in detail as far as possible.

Land.—Pupin and Péret take the results of the inquiry by the Ministry of France in 1908, but Pupin, after endeavouring to show its consistency with the statistics of 1879 (by means of index numbers of prices, &c.), adds 320 millions for the enhancement in value between 1904 (which he treats as the true point in time for the official value) and 1911. He then deducts 112 millions as the value of lands belonging to the State, Départements and Communes. M. R. Salefranque, writing in 1914 on "Les transmissions immobiliers "devant l'impôt,'' adopts the original values of 1878, as proper to 1914, by a comparison of the prices of produce. This figure, 3,640 millions, is probably considerably too high, but there is little doubt that the valuation by reference to the direct tax roll gives too low a result, possibly by 10 per cent.

Buildings.—Pupin and Péret adopt the findings of "L'administration des Contributions Directes" for 1909. Pupin adds for the increase in value for two years 64 millions. The underestimate, after dealing with the various considerations put forward by him, may well be 10 per cent. Indeed, other French writers have put the value of land and buildings *in* 1908 at 5,695 millions instead of Pupin's 5,368 millions for 1912, and Péret treats the figures as underestimated.

On the other hand, the mortgage debt of 600 millions (Michel's estimate) is not deducted (except by Pupin to the extent of 100 millions). Théry's total for these two classes, which he divides a little differently, is rather greater, 5,536,000,000*l.*

Pupin.	Million £.		Péret.	Million £.		Théry (1912).	Million £.	
Land	....	2,688	Land (1909-10)	....	2,480	Land	....	3,116
Buildings, &c.	....	2,680	Buildings (1908-12)....	....	2,600	Buildings, &c.	....	2,420
Valeurs mobilières belonging to French people	4,400		Government annuity and Treasury Bills	800		Valeurs mobilières—		
Less included under other headings	700		French personal property other than Government effects	1,628		French	2,770	
		3,700	Foreign personal property....	1,200		Foreign	1,707	4,477
Farm capital	420				3,628	Farm capital	367	
Capital in commerce, private industry and ministerial offices	720		Debts, private rent	1,260		Industrial and commercial funds	412	
		1,140	Offices, business funds	140	1,400			779
Other moveable wealth	....	480	Moveables, furniture, ships and vessels, personal goods	....	420	Moveable wealth	....	930
			Life insurance	60				
			Bank deposits	210				
Savings banks, life insurance, pensions, &c.	....	420	Savings banks and pensions	302	57			
Money	....	312	Cash	....	280	Gold and silver	....	378
		11,420			11,380			12,100

Fonds de Commerce, Industrie privée et stocks y attachés—Farm Capital.—Pupin takes the 1906 general census results and classes the commercial establishments as small, average (employing two to five persons) and large (employing more than five persons). He assigns an average profit of 12*ol.* to the first, 32*ol.* to the second, and 816*l.* to the remainder, giving 148,000,000*l.* for the whole number. The 630,000 industrial businesses are similarly treated, excluding 20,000 which are assumed to be accounted for in the values of shares, bringing these classes together up to 440 millions. Lavergne and Henry in 1908 had taken the official statistics of *la contribution des patentes,* and arrived at annual profits of 106 millions, which they capitalised at 260 millions only. Pupin suggests that at least three years' purchase should have been taken. These figures do not include stock in trade. In an ingenious work "Les Règlements par Effets de Commerce," Roulleau computed from the total Bills of Exchange stamped in 1911, and their average term, that they represented an average valué of 200 millions. Offices are valued, following Lavergne and Henry, at 75,000,000*l.* Farm capital is computed mainly from the known numbers of different classes of live-stock, amounting to 260,000,000*l.*, with an estimate for material. Péret's valuations under these heads are not strictly parallel, and are deduced from declarations of inheritance, with the multiplier of 35.

Valeurs mobilières.—The authority of Neymarck is relied upon by Pupin. Neymarck has certainly made very careful computations as to the total values quoted on the Paris Bourse (165 milliards of francs), but the elimination of one-third (55 milliards) as belonging to foreigners, societies, or held by companies whose shares are a mere duplication, is open to considerable doubt. "Ces 110 milliards représentent la fortune mobilière des capitalistes français, abstrac-"tion faite des titres conservés dans la portefeuille des Sociétés "par actions."

Péret quotes the statistics of the Administration of Registration as to the nominal amount of capital liable to stamp duty. The official estimate of Government annuities and Treasury Bills is 1,020,000,000*l.*, which Péret reduces to 800 to allow for foreign holdings. He considers that the common estimates ranging from 4,300 to 4,600 millions are over-stated.

Other moveable wealth.—Pupin includes furniture, clothing, jewellery and plate, domestic animals, vehicles, ships, &c. For furniture he proceeds upon the assumption that when the letting value of a house is below 200*l.*, the furniture has the greater value, but for premises lower than 40*l.* it has less, and on this basis he gets 80,000,000*l.* This is supported by taking a figure, per head, of

120 francs. Furniture is assumed to be worth a quarter of its cost, and clothing one-eighth (40,000,000*l.*). Vehicles are put at 40,000,000*l.* and ships at 20,000,000*l.* Péret's figure is obtained by the multiplier 35.

Savings Banks, &c.—These items lend themselves better than the majority to direct valuation.

Upon the whole valuation Pupin's total is clearly liable to a possible error of well over 10 per cent., and Péret admits that many of his items are rather below the real figure and that the total must amount to at least 12,000 millions. Théry's computation is the maximum to which any French writer, giving detail, has committed himself.

As a matter of fact, in France, "the classic home of the method "of the devolution interval," as Gini has said, statisticians have been hypnotised by the multiplier, and in the absence of the strong countervailing evidence that we in England possess, have put such confidence in its results, that they have distrusted the numerous assumptions of the inventory method when it leads to substantially higher figures. Pupin devotes a chapter to the multiplier, and declines to accept the traditional 35, "pieusement recueilli et transmis par les "plumes les plus autorisées." But his modification is confined to "l'annuité mobilière." He finds that in 1891–5, taking 1893, the valeurs mobilières appearing in "l'annuité successorale" amount to 1,574,000,000 francs, and at this time the amount of the "fortune "mobilière" was 78,000 millions, or 55 times as much. Similarly in 1896, the total was 52·4 times as great. He therefore takes as a basis the net values of "Successions" and "donations," divides the total into two, viz., "annuité mobilière" et "annuité comprenant "tous les autres biens," and multiplies the former by 50 and the latter by 35. In this way 7,155,000,000 francs has to be considered. "L'annuité mobilière" is taken as 110,000,000,000 francs divided by 50, or 2,200 millions, and the balance, 4,955 millions, is multiplied by 35 to give the equivalent capital, thus obtaining 283 milliards or about 11,300,000,000*l.* This method is, of course, no check at all upon the inventory method, and is reasoning in a circle, for it uses the inventory to get the multiplier in an empirical way, instead of obtaining a multiplier by independent means as a check upon the inventory. This multiplier is in no sense a true statistical coefficient from vital statistics. Pupin shows that the multiplier of 35 applied in detail gives results which show surprising discrepancies when compared with inventory values. Savings banks deposits, for example, only come to 50 per cent. of the acknowledged figures. He concludes his examination by saying that its lesson is easily gleaned.

"Do not condemn the method of the ***successorale annuité***, but correct "it, rejuvenate it, and then it will do you good service; all institutions are subject to similar exigencies, and the best buildings "can be made to resist the effects of time only if they are properly "restored"—which is a euphemistic way of saying that you must hammer the figures till they fit.

(Since the foregoing was written, and within the past week, the latest edition of Colson's *Cours d'économie politique*, just published, has come into my hands. In the third volume, devoted to this subject, he reaches the conclusion that the capital wealth at the end of 1913 was almost exactly 12,000,000,000*l.*, or 300*l.* per head.)

9. ITALY.

Corrado Gini and Lanfranco Maroi in their works upon the wealth and income of Italy, refer in detail to the investigations and estimates of the following writers in recent years: Nitti (1905), Coletti (1907), Gini (1909), Princivalle (1909), Colajanni (1910), Santoro (1911), Gabrielli Wiseman (1915), Benedetti (1916), Coppini (1916), Contento (1917), Savorgnan (1916), Corniani (1918), Gini (1918), and various others. Literary activity on the subject in Italy has evidently been remarkable, and space quite forbids that I should here examine all these efforts. I propose to give brief particulars of two or three of the more detailed investigations.

Million £ sterling.

	Gini for 1914.	Corniani 1914.	Santoro 1910.	Gini for 1908.	Princivalle for 1908.
1. Lands, including buildings in rural areas, mines, quarries....	1,760	1,200	1,000	1,480	960
2. Buildings (urban)....	800	800	480	640	480
3. Livestock	200	280	240	140	140
4. Money	56	120	68	68	67
5. Deposits, savings banks, deposit and current accounts....	304	240	140	176	177
6. "Rendita consolidata" and other public debts	240	480	412	220	220
7. Bills, shares and bonds	264	760	520	252	250
8. Furniture, &c.	460	—	—	120	220
9. Other moveable property	400	120	120	200	
	4,484	4,000	2,980	3,296	2,440 to 2,600

Gini builds his 1914 estimates upon his figures of 1908, by applying the ratio of increase shown by the death duty statistics, which lead from 3,296 millions to 4,000 millions, but he gives good reasons for supposing that actual wealth has increased at a greater rate. Maroi and Gini make a careful comparison with the estimate of Princivalle for 1908, and Gini, in the course of his long chapters, presses into service the inventory, the multiplier and the capitalisation methods in turn, as they happen to be available or appropriate. Gini's estimate for 1908 was 3,296 millions against Princivalle's 2,600 millions. His predecessors had used the method of the "intervallo devolutivo," and Gini shows why this method, especially in Italy, leads to deficient results. "Gli autori sopra citati non attri-"buivono poi, a mio modo di videre, un' importanza adequata all' "evasione, che essi ritenevano di solo ¼ del valore accertato e tassato, "ossia di 1/5 del valore effettivo." Princivalle's valuation was based mainly on the inventory method, and it differs from Gini's in attributing values of 960 and 480 millions respectively to lands and buildings against 1,480 and 640 millions, which Gini claims, with justice, I think, to have established. Maroi confirmed the view that no better starting point can be found for estimating Italy's wealth before the war than Gini's 1908 estimate (che è la più rigorosa e scientificamente esatta). Corniani's estimate seems to be a journalistic effort, lacking a scientific basis, and manifestly erroneous in details, as, for example, in the value of lands, although the total valuation is not far wrong.

Gini certainly went to very great trouble in his enquiries in each local area to ascertain the extent of the deficient valuation of land and buildings which, of course, dominate the whole estimate.

The estimate for Italian wealth falls, in my judgment, in Grade II.

The national income of Italy has not been so frequently determined, and no recent details are available. The income tax data are weak, and the occupational census method does not greatly assist. Bogart (*Direct Costs of the Present War*) adopts the current estimate of 800,000,000*l.*

10. SPAIN.

A French writer, M. André Barthe, has recently made a detailed estimate of Spanish wealth :—

	Million £ (approx.).
Buildings	500
Land	1,100
Livestock	160
Stocks and shares	240
Equipment	72
Furniture and moveables	360
State debt	360
Precious metals	80
Banking current accounts	8
Stocks of goods in hand	60
Total	2,940

He rejects the multiplier method owing to the fact that the statistics of the succession duties go back to 1891 only. But the figures of even the highest year, with a multiplier of 27, give ridiculously low results. The Register of Property gives an average letting value for buildings of 20,000,000*l.*, corresponding to a capital value at 4 per cent. of 500 million as against the value by the multiplier method of only 324,000,000*l.*

In the case of land, the products alone are worth 240,000,000*l.* annually, against a capital value on the multiplier method of 373,000,000*l.* The share capital and the profits of large companies form the basis of valuation for business, and smaller trades are taken at an average capital of 160*l.* for 95,000 establishments. Three million families are credited with household possessions on an average of 120*l.* each. The other items of the inventory are calculated in the ordinary way. The value of State lands is cancelled by the entry for the State debt, and collective wealth generally has been included.

Barthe computes the national income on the eve of war, as follows :—

	Million £.
Property and livestock—1,760 millions at $3\frac{1}{2}$ per cent.	61·6
Wages of 2,000,000 workpeople....	80·0
Stock, share and State debt	28·6
Official salaries, taxed and not taxed	20·5
Profits of five classes taxed to l'impot des patentes; 389,000 taxpayers at an average of £100 each (corresponding approximately to the tax capitalised at 5 per cent.)	37·5
	228·2

A Spanish writer, F. Bernis, puts the income at less than 240 millions (*Economic Journal*, March, 1919, page 83). These results give the capital per head *prima facie* too high, and the income apparently too low compared with other countries.

11. AUSTRIA-HUNGARY.

The most authoritative and recent estimates of wealth are by F. Fellner, who wrote a book in 1913, and also made a report to the International Congress at Vienna. His estimate on the inventory method has been revised from time to time since 1902.

Million £.

	Austria.	Hungary.
Landed property	1,206	830
Mines and foundries	235	93
Buildings	624	357
Means of communication....	438	242
Moveable wealth	1,100	554
Investments abroad	216	8
	3,819	2,084
Deduct for debts due to foreigners	288	350
	3,531	1,734
	5,265,000,000*l.* as for 1910-12.	

Neymarck estimates from 5,250 millions to 6,666 millions and Péret, working upon Fellner's figures, 6,175 millions for 1913. As regards income, there appears to be no recent estimate. Bogart (*Direct Costs of the Present War*) relies upon a figure of 1,100,000,000*l.*

12. CAPITAL WEALTH IN OTHER EUROPEAN COUNTRIES.

I now propose to give brief references to estimates which, generally for reasons of language, I have not been able to consider first hand, but for which I am dependent upon intermediate sources, Gini, Péret, Maroi and others.

Holland.—Gini quotes Boissevain's estimate (on various bases) of 880,000,000*l.* or 192*l.* per head in 1892, and by reference to the ratio of probate returns in the two years, increases it to 1,200,000,000*l.* or 205*l.* per head in 1909.

In a comprehensive work on the statistics of National Wealth, National Income and Public Bodies, published in 1917, Dr. Verrijn Stuart brings his figures for 1888 up to date, and covers the period up to 1910. He reaches 1,050,000,000 mainly upon the "multiplier" basis.

Sweden.—Flodström for 1908, working on the inventory method, computed 767,000,000*l.* as the inclusive national wealth (or 633 millions for individuals) being 141*l.* per head. Fahlbeck, on a similar method, 1913, reached for the year 1908 777,000,000*l*., or 143*l*. per head:—

	Million £.
Agricultural property and State forests	208
Other properties	263
Mines, &c.	29
Fisheries	5
Means of communication	50
Merchant marine	9
Livestock and agricultural produce	55
Machinery, &c., personal moveables	210
Money and foreign credits	23
	852
Debts due to foreigners	75
Total	777

The average rate of increase in the decade was 27,000,000*l*. per annum.

Belgium.—A survey of Belgian wealth published in 1913 by the Finance Ministry of Belgium gave the following estimates:—

	Million £.
Land	264
Buildings	235
Personal wealth	545
Cash	17
Furniture, &c.	120
	1,181

or 156*l*. per inhabitant.

As long ago as 1892 it was estimated by Graux and Beernaert at 1,400,000,000*l*. (or 224*l*. per head). Gini raised this to 1,860,000,000*l*. (or 254*l*. per head) for 1908 on the basis of the increase in death duty statistics. But Julin's composite index number "The "economic progress of Belgium" (*Journal*, February, 1911) showed a rise from 116 in 1892 to 187 in 1908, and it would appear that the earlier estimate must have been excessive. On the other hand, the recent estimate seems, *prima facie*, too low, and in the absence of comprehensive revenue or tax statistics, no close estimate is possible. Maroi refers, without quoting authorities, to recent estimates of 2,400,000,000*l*. (or 300*l*. per head) on the eve of war, but it appears to me that it has proceeded on the same basis as Gini and been carried to 1913.

Norway.—Working upon old estimates for 1884 and 1891, Gini arrives at an estimate for 1911 of 184 to 214 millions, or 79*l*. to 90*l*. per head.

Denmark.—Gini quotes 404,000,000*l.*, or 166*l.* per head for 1900.

Switzerland.—Steiger has computed the private wealth of each canton separately for 1900 and 1910. His total was 580,000,000*l.* But Gering and Holz (*Economic politique de la Suisse*) reach 800,000,000*l.*, taking greater account of tax evasion. Gini accepts 600,000,000*l.* to 800,000,000*l.* or 160*l.* to 216*l.* per head.

Russia.—Maroi quotes an estimate of 12,000,000,000*l.*, and Péret says it would amount to "at least" 8,000 millions; while Neymarck puts it from 10,000 to 13,000 millions. They are all wide guesses. The Commission of the Duma in 1910, in reporting on the Income Tax law, estimated the income at 980,000,000*l.*, which seems to be an obvious underestimate.

Turkey is credited by Maroi with 1,400 millions, or 64*l.* per head, and *Bulgaria* with 400 millions, or 90*l.* per head, but Neymarck estimates 600 millions in the latter case. For *Roumania*, Neymarck estimates from 800 to 1,120 millions, and Péret says that it has been "quite recently" put at 860 millions, in which figure were included "the State fortune, railways and forests—but the data "are open to discussion." *Serbia* is given 480 millions, or 105*l.* per head, by Maroi.

For *Greece*, Gini quotes an old estimate (1890) by Skiadau of 2,200 millions, or 88*l.* per head.

13. AUSTRALIA.

The "well informed guesses" put forward by Sir Robert Giffen in 1903 for the various parts of the British Empire have been relied upon by most writers, but so far as Australia is concerned they have now been definitely superseded by perhaps the most thorough and complete attempt that has yet been made to ascertain national wealth.

Sir T. Coghlan made reasoned estimates for 1903, in ten classes, amounting to 982,000,000*l.*, or actually less than his estimate for 1890, viz., 1,019,000,000*l.*

In July, 1915, an Act was passed by the Federal Parliament making provision for a war census. In one of the schedules issued by the Commonwealth Statistician in connection with this matter, all persons over 18 years of age, irrespective of sex, possessed of property, holding sums on trust, or in receipt of income, were required to give particulars of the same in such a manner as to show the new value of the property, less debts and liabilities outstanding at December 31, 1914, as well as income from all sources, with deductions of various kinds. The results are set forth in considerable detail in a publication prepared by the

Commonwealth Statistician, entitled "The Private Wealth of "Australia and its Growth as ascertained by various methods, "together with a Report of the War Census of 1915" For Australia as a whole, the final figures were:—

Number of returns for individuals	2,195,065
	£
Aggregate of net incomes for year ended June 30, 1915	257,650,251
Aggregate of net incomes of individuals	241,236,552
Aggregate of net assets at June 30, 1915....	1,643,463,376
Aggregate of net assets of individuals	1,224,225,994

The difference between the two separate statements of income and assets is explained by the fact that the higher figures in each statement include returns from non-resident partnerships, trust funds, companies, and institutions. Income from trust funds is, in the main, included in the "individual" returns of beneficiaries. Similarly, the aggregate of net assets of individuals includes the value of interests in trust estates, assurance and annuity policies, &c.

In the tables relative to income and assets, the allocation to States and territories is based on the locality of residence of the owners or representatives, not on the locality in which the income was earned or the assets are situated. The aggregate of net incomes and assets of individuals, non-resident partnerships, trust funds, companies and institutions for the year ended June 30, 1915, is apportioned among the States and Territories as follows:—

States and territories.	Income.		Assets.	
	£	Per cent.	£	Per cent.
New South Wales	101,382,366	39·34	645,699,068	39·30
Victoria	78,987,957	30·66	565,337,460	34·40
Queensland	34,244,339	13·30	163,803,435	9·97
South Australia	20,129,634	7·81	154,623,129	9·40
Western Australia	15,310,227	5·94	67,869,080	4·12
Tasmania	7,281,846	2·83	44,945,491	2·74
Northern Territories	210,654	0·08	842,734	0·05
Federal Territories	103,228	0·04	342,797	0·02
	257,650,251	100·00	1,643,463,376	100·00

It will be observed that "individual" income is 93 per cent. of "total" income, and "individual" capital is 74 per cent. of "total" capital.

Giffen's figures of 1,100 millions for Australasia in 1903 was, if anything, *below* the actual mark. Mr. Knibbs' volume is interesting, not merely from its full account of a genuine *census* of wealth, but also for its general theoretical examination of the multiplier and its parallel results in practice, the relations between income and capital, and much information on the question of the distribution of wealth.

The method of avoiding duplication between the dividends received by companies and the profits made by companies is described as follows:—

A special tabulation was made of the total assets shown on the cards as comprising shares and debentures of companies and a special return was obtained from all Australian companies showing the undistributed profit during the year under review, including sums transferred to reserves. In the final tabulation of the results, the net assets of all companies were reduced by the amount of shares and debentures in companies shown as being held in Australia, the balance representing, approximately, the amount of outside capital invested in companies operating in Australia. In the case of income, the wealth and income card did not furnish a means of determining the total income derived from dividends of companies. The special returns of undistributed profit mentioned above was consequently taken as furnishing for Australian companies the net income not included in shareholders' returns.

"The net assets of the Australian companies were taken from "special returns obtained from these companies, such net assets "being computed without deducting the liabilities to share and "debenture holders. From the total net assets so computed, the "aggregate amount of shares and debentures in companies shown "on the various individual and other cards was deducted, the "balance representing, approximately, the interest in Australian "companies held by persons not resident, together with the margin, "if any, between the share valuations of the several shareholders, "and the valuation of net assets made by the company officials."

The income relating to non-residents was only just over one million, and the balance (for individuals) represented 48*l.* 9*s.* 7*d.* per head (50*l.* 10*s.* 4*d.* in New South Wales, 50*l.* 11*s.* 2*d.* in Victoria), but, per return, it was 110*l.*

The capital wealth is of course distributed between the States according to the States of domicile of the owners. The total of 1,643,000,000*l.* includes the Australian property of non-residents, estimated as between 150,000,000*l.* to 200,000,000*l.*, but does not include the property of Federal States or Local Governments, so that "the aggregate private wealth of Australian residents as at "June 30, 1915, was approximately 1,470,000,000*l.*, or nearly 300*l.* "per head."

The question of the number of persons owning wealth who made no return for the census, received careful consideration, and it was decided that the whole measure of uncertainty was "negligible as "compared with that due to unavoidable limitations in the estimate "of values, and perhaps also as to the amount of income." Several classes of wealth were separately aggregated. "Cash in hand" came to nearly 6 millions, and worked out per head of the population at a considerably lower figure than independent estimates made in other ways. It was found that the "net assets" of the companies, making no allowance for liabilities to shareholders and debenture holders, was 286 millions, whereas the individual returns came to 61½ per cent. only, "the balance being presumably held by absentees." There is, of course, the margin of reserve value to which reference has been made, and the general question of plus or minus goodwill valued in the shares, but not included in the assets, is not cleared up. The aggregate value of land (as improved) was 984 millions, and, as unimproved, 456,000,000*l.*, which, so far as comparison could be made, was not out of accord with the information furnished by the Land Tax assessments. Knibbs' work provides a very exhaustive and acute discussion of the probate method in principle and in application, and he concludes that "in Australia it cannot lead to "satisfactory results owing to the absence of the necessary data "regarding settlements. The defect introduces great uncertainty "into determinations from probates, a fact forcibly illustrated "by the necessity of applying a 'correction' factor of about 1·6 to "the results obtained from probates, in order to bring them into "agreement with the estimates obtained by the War Census."

He then makes a complete estimate of Australian wealth on the "inventory method" for 1915 (omitting public property, whether national or communal), and given in detail for each colony. The results aggregated for the Commonwealth are as follows :—

	Million £.
(1) Land and improvements	1,105·6
(2) Live stock and agricultural machinery	123·1
(3) Manufacturing plant	40·0
(4) Mining properties and products	43·6
(5) Coin, &c.	44·4
(6) Railways and tramways and shipping	25·1
(7) Agricultural products	59·5
(8) Locally-manufactured products	54·3
(9) Imported merchandise	31·8
(10) Clothing, &c.	14·9
(11) Furniture, &c.	77·1
	1,619·5
Private wealth per head	327*l.*

The estimate for lands, &c., is based upon municipal valuations, and represents about two-thirds of the total; in several States which show unimproved or annual values only, the figures have been converted into "improved capital values" by the application of factors. It is probable that this valuation is correct within 5 per cent., certainly within 10 per cent. Annual statistics of the numbers of live stock, of the values of agricultural machinery, of manufacturing plant, &c., are then utilized. Mining properties are taken from statistics of paid up capital and dividends, and may have a larger margin of error. For all the other items there is some substantial basis of estimation, and taken by itself the inventory result might well claim to be correct within very little over 10 per cent.

After adding collective wealth Mr. Knibbs concludes that the inventory method gives 1,760 millions, the Census 1,643, and the probate basis 1,000 millions, and that the Census probably gives an understatement owing to (1) its emergency character, (2) the incompleteness of some returns, and (3) the tendency for persons to suspect taxation motives. The inventory method, of course, covers wealth in Australia owned by persons not living there, but does not include Australian holdings of wealth abroad.

14. CANADA.

The estimates that have been currently used for Canada are Giffen's "guess" for 1903 of 1,350,000,000*l.* and Crammond's figure for 1910 based thereon of 2,072,000,000*l.* with an income of 259,000,000*l.*

We have now available a reasoned inventory published in the *Journal of the Canadian Bankers' Association*, 1915, and made up with information from various sources:—

	Million £.
Farm values	687
Mines and forests	164
Railways	231
Urban real property	618
Manufacturing machinery	62
Livestock and implements	182
Stocks of raw material	164
Carriages and motors	124
Specie	33
Investments abroad	20
	2,285

I think it is quite probable that this estimate is correct within 20 per cent., and I have accordingly classed it in Grade II.

15. JAPAN.

I have been unable to trace any recent estimate of wealth or income, or any reference thereto, in European literature, and Neymarck and Péret say definitely that there is none.

The income tax has now been in force for a good many years, and should furnish the basis of a provisional estimate, if carefully handled. Ordinary incomes under 40*l.* are exempt, and there are numerous other minor provisions for allowances and exemptions which may be studied in the Financial and Economic Annual issued by the Japanese Finance Department. Mr. C. V. Sale in 1911 gave the following estimates for 1907:—

1,125,000 families paying income tax	70*l.* average income.
8,025,000 families not paying income tax	24*l.* 10*s.* ,, ,,
9,150,000	30*l.*

or a total income of 275,000,000*l.*

I have obtained the weighted average wages for 1913 for nearly one million operatives, employed in 50 trades, with an average wage for each trade given by the official statistics, and find that it does not exceed 12*l.* per head (including about 8 per cent. children), so that it would not appear that the above average could be increased, in view, especially, of the poor return from agriculture. Mr. Sale obtained an average of 27·8*l.* gross produce per family in getting at the above figure. My estimate for 1914 would be on the following lines:—

	£
Income taxed	78,826,000
Allowances and exemptions	80,000
Evasion, 50 per cent. of the income in the lowest grade	18,000,000
And 20 per cent. in the incomes above	12,000,000
	108,916,000
Increase, 8 per cent. from 1908 to 1914	7,132,000
Total for income-tax payers	116,048,000
Lower classes—8,500,000 families at 24·10 average	208,000,000
Total (say)	325,000,000

The *Japan Year Book*, 1910, to which Mr. C. V. Sale has drawn my attention, reports an estimate by K. Yamashita, as at 1904, of the total value consumed, or money spent, by the Japanese given in some detail and aggregating to a figure between 270,000,000*l.* and 295,000,000*l.* This "consumption" estimate rather confirms the above direct result.

There was an estimate of capital quoted in the same work, as at 1902–04, of 1,328,000,000*l.*, or 29*l.* per head, as arrived at by "financial authorities." Another estimate, for 1904, is referred to by Mr. Sale,[1] as appearing in a work by Igarashi and Takahashi (*National Wealth of Japan*, 1906), which amounted, apparently, to 2,280,000,000*l.*, but I have been unable to examine it in detail. For 1914, on details obtained from the financial annuals and other sources, I put forward the following tentative effort :—

	Million £.
Land	1,100
Buildings	400
Furniture, &c.	150
Specie, &c.	38
State debt raised at home....	100
Local debt	30
Mines	30
Commercial companies	370
Other businesses	100
Savings bank	62
Private railways	6
	2,386

say, 2,400,000,000*l.*

In this I have excluded the value of State businesses (tobacco, salt, camphor, railways) on the ground that they are practically equalled by the State debt held by the Japanese.

16. ARGENTINE REPUBLIC.

According to *L'Anuario de la Dirección General de Estadística*, published in 1910 for 1908, the private wealth was put at 1,260,000,000*l.*, or 212*l.* per head. A valuation has recently been made by Alessandro Bunge, Director-General of the Official Statistical Office of the Republic, who, working entirely upon the inventory method, reached the following results :—

Million £.

	1908.	1916.
Lands	562	918
Fixed plant	54	93
Buildings	519	588
Household goods and objects of art	130	147
Businesses	128	277
Agricultural profits and produce	108	108
Partly manufactured goods and goods in transit	130	143
Agricultural machinery	16	35
Industrial machinery	35	38
Metals	34	69
Railways	181	292
Tramways, telephones, gas, &c.	52	59
Ports, canals, docks	52	57
Total	2,000	2,824

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[1] *Journal of the Royal Statistical Society*, 1911, p. 482

The amounts per head on this valuation are high, viz., 336*l.* and 356*l.* respectively. It may be taken that this official's estimate for 1914 would be in the neighbourhood of 2,400,000,000*l.*, or about 340*l.* per head.

17. SUMMARY AND CONCLUSION.

I shall now proceed to summarise the foregoing in a single table (see next page), bringing the results as nearly as possible to the same pre-war point of time in 1914, and showing the approximate per capita amounts for comparative purposes. In the grading I have sometimes taken a lower class than the original estimate itself would require, if the adjustment to bring it to the level of 1914 has been considerable.

Comment is perhaps superfluous, but I may remark that the generally higher level of pre-war prices in America (which is reflected in the per capita average) cannot discount the immense absolute lead of the States in real wealth, or the rapidity of its increase. The difference between the United Kingdom and Germany is not so considerable as other writers have suggested, and the effects of the well-known thrift of the French nation are apparent. The Japanese are making immense strides, but over 60 per cent. of their population are engaged in agriculture, and live on an amount per head which would be impossible in Europe—indeed, a comparison with this leading Eastern nation's figures brings out the considerations which I have urged in my opening paragraphs.

I should like to state that I do not pretend to have exhausted the subject, for it is obvious that a complete critical compendium of all that has been done in recent years would take up much space and be an exceedingly laborious task. But if I have succeeded in bringing some kind of order out of existing confusion, even over only a part of the field, I shall have achieved all that I set out to do. Apart from any interest there may be in present comparisons, I feel that in years to come, the year 1914 will be taken as the starting point for measuring many kinds of change and development, and that this contribution may have some small measure of utility to future workers. Adam Smith's words in the "Wealth of Nations" may form a fitting conclusion :—

> "Parsimony, and not industry, is the immediate cause of "the increase of capital. Industry, indeed, provides the "subject which parsimony accumulates, but whatever industry "might acquire if parsimony did not save and store up, the "capital would never be the greater." . . . "Whatever, "therefore, we may imagine the real wealth and revenue of a

Summary Table, showing the estimated Wealth and Annual Income of various Countries at the outbreak of War in 1914, *and the approximate accuracy of the respective estimates.*

Country.	National capital.				National income.			
	Estimates based on the work of	Approximation to accuracy: Grade.*	Amount in million £.	Amount per head of population.	Estimates based on the work of	Approximation to accuracy: Grade.*	Amount in million £.	Amount per head of population.
				£				£
United Kingdom	Stamp	I	14,500	318	Bowley, Stamp	I	2,250	50
United States	Official, King	II	42,000	424	Official, King	II	7,250	72
Germany	Helfferich, &c.	II	16,550	244	Helfferich	I	2,150	30
France	Pupin, Théry	II	12,000	303	Pupin	II	1,500	38
Italy	Gini	III	4,480	128	—	IV	800	23
Austria-Hungary	Fellner	III	6,200	121	—	IV	1,100	21
Spain	Barthe	IV	2,940	144	Barthe	IV	230	11
Belgium	Official	III	1,200	157	—	—	—	—
Holland	Stuart	III	1,050	167	—	—	—	—
Russia	Neymarck	IV	12,000	85	—	—	—	—
Sweden	Flodstrom, Fochlbeck	III	940	168	—	—	—	—
Norway	Gini	IV	220	90	—	—	—	—
Denmark	Gini	IV	500	176	—	—	—	—
Switzerland	Gini	IV	800	205	—	—	—	—
Australia	Knibbs	I	1,530	318	Official, Knibbs	I	258	54
Canada	Bankers' Association	II	2,285	300	Giffen	IV	300	40
Japan	Stamp	IV	2,400	44	Stamp	III	325	6
Argentine	Bunge	III	2,400	340	—	—	—	—

* Grade I. Estimate is not likely to be inaccurate to a greater extent than 10 per cent.
,, II. ,, ,, ,, ,, ,, ,, 20 ,,
,, III. ,, ,, ,, ,, ,, ,, ,, 30 ,,
,, IV. ,, *may* be inaccurate ,, ,, ,, 40 ,,

> " country to consist in, whether in the annual produce of its
> " land and labour, as plain reason seems to dictate, or in the
> " quantity of the precious metals which circulate within it, as
> " vulgar prejudices suppose; in either view of the matter,
> " every prodigal appears to be a public enemy and every frugal
> " man a public benefactor."

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Discussion on Dr. Stamp's Paper.

Sir Felix Schuster said he had the greatest pleasure in moving a most cordial vote of thanks to the reader of so valuable and interesting a Paper, a Paper which he hoped would be widely circulated amongst the public, as it contained just the sort of information that was really wanted. It was only as an ordinary member of the public that he ventured to address that distinguished gathering, and he did so with great diffidence, not only because he was one of the youngest recruits to the Society, but also because he could not possibly claim to be a scientific economist. His occupations, especially during the last five years, had made it impossible for him to keep up with the literature which had been produced during that time and had made him forget to a great degree what he had read before. But that perhaps made a vote of thanks more than the usual formality. He said in all sincerity that he was deeply grateful to the reader of the Paper for the information contained in it, which presented in a very intelligible and simple form valuable results and the methods by which they had been arrived at. Perhaps he was one of the persons alluded to at the beginning of the Paper who, he would not say had despised statistics, because he had never done such a thing, but who had very often looked upon statistics such as were sometimes produced in the papers and elsewhere with profound suspicion. The reason was because one saw the object for which they were produced. and that the methods which were adopted were not scientific. They had listened to a Paper that evening for which he was sure it could be claimed the results which were shown were the best that could possibly be arrived at from the information available. The part which appealed to him most was the test of the relative prosperity and resources of the different nations, and also the test of our own wealth and prosperity with regard to the future. As to the methods adopted in presenting a statement of our own wealth and income he certainly agreed with what had been said, that the total amount of the national debt must be deducted from the aggregate statement of wealth. He ventured to think in the national debt they ought also to include the indebtedness of local authorities, because they were equally a mortgage on the income of the nation. For instance, in the ordinary statement of the national debts such items as Irish land stock or local-owned stock were not included at all, because they were only contingent liability, but still they formed a mortgage on the whole. It was not clear whether in the summary table these amounts had been deducted, but in his opinion they should be if they wished to get a correct result. A proper allowance should be made for State property, which was an item it was difficult to get at. He did not perhaps quite follow one sentence in which the reader alluded to it where he said that if the national debt were deducted from State property they would get a minus quantity in many cases. He thought they would almost invariably get a minus quantity. As far as he knew, before the war, India was the only one of the great countries where there was practically no taxation for payment of interest on debt. He was sorry that Dr. Stamp could not include India in his statement. The difficulties were obvious and very great, but it would have been interesting. Perhaps one of the German States also, viz., Bavaria, before the war had great national property. But all that would disappear after the war, and they would have a minus quantity. Coming to the test of income tax returns and the test of income generally, he was afraid that their present methods led to confusion and also to loss of revenue. They had now adopted a double system instead of invariable taxation at the source, and he regretted to say during the last loan operation the latter was abandoned, and in certain loans now on the market the deduction did not take place at the source. That must lead to confusion in the end, and he thought they would be driven gradually into the census method and to adopt that method alone. He personally thought that eventually taxation at the source would have to be abandoned altogether. A personal statement by everyone was, he thought, inevitable in the future. At present a good many people quite innocently did not pay what they ought because they thought everything was taken off at the source and forgot to send in their returns. He did not think there was very much intentional evasion. He spoke from a certain amount of experience, because for a number of years he had been one of the additional Income Tax Commissioners in the City of London. He spoke strongly for the straightforwardness and honesty of the returns. He really thought that if there were any error in the accounts the error was rather against the taxpayer and in favour of the State. There were a few flagrant cases where one saw evasion, but very few, and on the whole he thought they could trust the returns to be straightforward and honest as long as the taxpayer knew what he had to do and the lines were very clearly laid down for him. He thought the time would come before very long when they would have to have a census of property generally on simple lines clearly specified. They would then have an effective test and be able to arrive at a proper solution of what the wealth of the country really was. He did not think the Death Duties test was at all reliable. Dr. Stamp had pointed out some of the disadvantages of that method, and there were others one could add. This was not the place to speak of the ethics of taxation, but he considered the Death Duties one of the most insidious forms of levy on capital which, if it took place at all, ought to be used in the reduction of debt and not as revenue, and that reliance on Death Duties would prove a great pitfall for a future Chancellor of the Exchequer. Coming to the summary table he had tried to work out the proportions between the income that was shown and the capital. He had hoped to arrive at some general conclusion as to their relationship. He thought one might come to some conclusion whether highly-developed countries showed similar or different results to countries in which there was not such a high grade of development; but he did not think he could find much help in these returns. The proportions came out very similarly. The United Kingdom 15½ per cent., the United States 17 per cent., Germany 13 per cent., France 12½ per cent., Italy and Austria 18 per cent., Canada 13 per cent., Australia 16 per cent., and Spain only 8 per cent. But, as Dr. Stamp had pointed out, the figures for Spain could not be a true test of the situation. It did not appear whether the national debts had been deducted. But it was the future one had to consider, and they all looked forward to the next table for the post-war period which Dr. Stamp was going to produce, and which would be highly interesting. With regard to the national debts of various countries it would be very important to state where the debt was held, whether it was an external debt or an internal debt, as that would have a very important bearing on the economic position of the country concerned. Inflated and depreciated currencies would have to be taken into account. He supposed they would all be translated not at the par of exchange but at the real exchange of the day, and they would get some very different results from those which were shown in the table. If they wanted to arrive at a true test of the national wealth, they would also need to have a statement of the comparative cost of living in the various countries, and the table with the Index Numbers of the cost of the necessaries of life would be a very useful thing to have in such a statement. If it were possible to obtain it, he would also like to know what he would call the effort to attain the results: how much time was spent and what were the working hours. If they had those they would then have a true measure of the wealth. He supposed it was impossible to classify brain power. What they had to get at, as Dr. Stamp had pointed out, was not the actual wealth in being, but the potential wealth—the development and future efforts that were possible in the various countries, and especially in their own, in order to meet, as they had to meet, the difficulties which were in front of them during the coming years. Dr. Stamp had given them most valuable help in considering all those grave matters, and he wished to express the warmest thanks of the meeting which he was sure were due to him.

Sir GEORGE PAISH said he had very great pleasure in seconding the resolution. They were all greatly indebted to Dr. Stamp for the paper, which at the present time was of special value. They were all wondering how they were coming out of the war and how it was to be paid for. The credit of the world had been extended as it probably had never been extended before, and they wanted to know exactly where they stood. The paper would certainly help them in that direction. It was quite obvious that debt was not wealth. At the same time, it was not destruction of wealth. The internal debt of a nation was held within the nation, and the holder of the debt placed it amongst his assets, while the rest of the community had to place it among its debits, and the two squared. The foreign debt was, of course, a debit, and they had to allow for it. Unfortunately, at the present time they had incurred a very substantial debt abroad, and they must allow for that fact. On the other hand, they had loaned a good deal of money to their Allies and Colonies, and, if that were good, it would go against the money they owed. He thought it would be nearly, if not quite, sufficient to pay off their foreign debts. Unfortunately the whole of their loans to Allies were not good; and, therefore, they had to allow as a debit against their wealth the net sum that they owed abroad on war account after placing a reasonable value upon their losses. Of course the nation had immense foreign investments in the aggregate to place against the money borrowed abroad during the war. It was computed that before the war their assets abroad were about 4,000 millions. If they deducted from that sum the loss they had incurred from bad foreign investments during the war, he thought they would still find they had over 3,000 millions sterling abroad on balance after paying their debts abroad. So that they were in a very strong position. With regard to the debt which had been incurred, it was quite true that the nation as a whole could not regard that asset as a credit; on the contrary, it was a debit; but the people who had subscribed to the debt and held it as an investment, necessarily included it in their accounts as an asset. When they came to consider how much wealth there would be available in the event of a levy, they must not only include the assets of the nation, but the debt of the nation, which was owned by private persons. If they did that, they would find that Dr. Stamp's basis of something like 14,500 millions as the wealth to be levied upon would come to something like 20,000 millions, which was including only 5,500 millions of debt, instead of the 7,400 millions they had incurred, the balance having been provided in part by borrowing abroad and in part by calling in money which they had previously loaned abroad. But the sum, at any rate, on which they would have to levy would be something like 20,000 millions on that basis. The amount would, indeed, be still greater than that if they took into account present valuations. Dr. Stamp had rightly not tried to bring the calculation up to date. It was quite impossible for anyone to do so, as no one knew what the value of property would be. They did know that in so far as property was changing hands at the present time, the value had very greatly increased. And the cost of replacing the property of the nation—buildings, works, machinery, &c., would be infinitely greater than the value stated in Dr. Stamp's work. So that, when they came to think of a levy on anything like existing values, they had to consider that the wealth was not some 14,500 millions, as estimated by Dr. Stamp, but a very much larger sum, and they would also have to include their war debt. As to Dr. Stamp's statement with regard to the wealth of Germany, he was inclined to think there was an exaggeration. As he rightly pointed out, the various estimators wished to make it look as large as possible. Before the war Germany engaged in a campaign of flag-waving, as it were, exaggerating everything that it did, and making it appear that Germany could do quite extraordinary things. That campaign of exaggeration must be taken into account in reckoning what the wealth and income of Germany were prior to the war. He himself was very doubtful if even Dr. Helfferich's figure was correct. He thought that if they could have got an impartial investigator, they would have found it was still smaller. Referring to Sir Felix Schuster's statement with regard to income in relation to capital, that was a matter of very great importance. It was, of course, of importance that the capital they created and invested should yield a profit, but it was not nearly so important as that it should yield an income. For example, roads were a source of outgo. If they merely had to capitalise the profits of the nation, they would have to leave the roads out of account. They were of very great value and were an expense; but as a source of income they were of greater value than almost any kind of wealth other than the land, because without them they could not move the produce from place to place. So it might be with regard to other things. What he thought a nation should do was to try and keep its capital account down to the lowest possible figure. One of the things they were up against in their competition with Germany was the fact that some of the German companies—as, for instance, the Allgemeine Elektricitäts Gesellschaft—had written down some of their most important works to a mark, so that they had to pay no interest whatever on capital. In a time of competition such companies could disregard their capital account altogether, which seemed to him the desirable thing to do. As they knew, the American railways did the same thing. Year after year they devoted very large sums to betterments, and the result was that the capitalisation of American railways was extremely low in proportion to their value. From the companies' point of view, that was an advantage that could not very well be exaggerated, because the world from time to time got into periods of depression, and if they had debentures or preference dividends to meet, and there were no profits, companies were apt to go into bankruptcy. If, on the other hand, they had written down their capital to almost nothing, they could weather through the most severe storms. So that, while they must attach a certain amount of importance to the question of profits in relation to capital, he attached still greater importance to the table which Dr. Stamp had given them, showing the relation of the income of the nations to the capital of the nations. In calculating the capital in those circumstances, they would have to take what he might term an asset value. They would take item by item and value it at what it would cost to reproduce, and then discover what proportion their income bore to their capital account. That was the great thing. They as a nation had now to endeavour to increase their income in relation to their capital, and he was convinced they could do it. The amount of inefficiency they had had in the past in all directions was simply extraordinary. They were now up against a very difficult situation, and he thought they could make their capital go very much further than it had ever gone before. If, for example, they could double their traffic on the railways without any appreciable increase of capital, the real value of that capital would be immensely greater than it was at present. It seemed to him that all the data Dr. Stamp had given them would enable them to think out more clearly the extent, value and use of their capital, and so help to make the nation more efficient.

Mr. PETHICK LAWRENCE said he thought no one would refuse to Dr. Stamp the tribute of the extraordinary care and great value of the paper he had read. He had taken the whole of the world as his province, and they had as a result a monumental standard which, in after years, would be looked back upon with the very greatest interest. They could not help regretting that he had not been able to bring the figures up-to-date as they would then have been still more interesting, but those who had attempted to consider the figures of recent years realised the extreme difficulty of doing that, and in any case they already had so much in the Paper that they could hardly ask for more. He wished to utter one warning with regard to figures taken for any particular year in that there was a time lag which he thought should be borne in mind. When they were dealing with purely pre-war figures the time lag might be comparatively unimportant, but when they were dealing with rapidly changing figures the time lag was exceedingly important. All the figures were put down for 1914. He hoped Dr. Stamp would tell them afterwards whether he thought they really represented the income for the year 1914 or whether they represented the income worked out in 1914, but really corresponding to the actual income of perhaps somewhere between 1912 and 1913. The same remarks applied somewhat to the matter of capital, but he was not quite clear whether the figures given in the Death Duties were really the figures for the deaths at those periods or whether they were amounts received corresponding to probates in those periods. That would make some difference and would affect the result. He asked Dr. Stamp also whether he had considered the reverse side to evasion. They had heard a good deal of evasion of income tax, but he had been brought into contact a good deal lately with cases where people did not claim all the deductions they were entitled to. He had not looked into it sufficiently to see whether it would affect totals, but it might do so in some cases. With regard to the inventory method of coming to a total he was not sure that sufficient importance was attached to the danger of overlapping. As a serious instance of overlapping with regard to post-war wealth he quoted the case of the banks. People would sometimes work out the total wealth of these on the basis of the value of the bank shares, and would say that the wealth of the banks was a little more or a little less than it was before the war. They would then take the whole of the war debt not owned abroad and would add that to the wealth and say that the wealth had increased by so much. Banks held a very considerable amount of war debt amongst their assets, and he thought there was a danger if they were not careful that they would count the same thing twice over. That danger was mentioned, he thought, by Dr. Stamp with regard to the inventory method, but it might be very much more important than many people realised. One or two people had spoken rather disparagingly of the multiplier method. He ventured to think that it was more valuable than they had said, and he did not believe that the difference between the two methods was as great as was sometimes supposed. He had had reason recently to work with that method, and had found for the purposes for which he required it that there were a great many additions to be made, and those additions brought it very much nearer to the figures Dr. Stamp had arrived at on his own method than many people supposed. There was in particular the question of what Dr. Stamp had called communal wealth, and what he (the speaker) had called institutional wealth, including such things as the wealth of churches and chapels (which had lands and other property), the wealth of clubs, friendly societies and trade unions, &c., which probably came in all to no less than 2,000 millions or something near that figure. It made a very great deal of difference whether these were or were not included in what was called private wealth. He thought Dr. Stamp would probably agree with him when he said that it seemed to him that all the methods of computing wealth were important provided the purpose for which the result was to be used compared with the means by which the results had been obtained. For the purpose of finding the effect of a new income tax the best figure of wealth was one based upon the Income Tax Returns ; but if they were to attempt a levy on capital then he thought the multiplier method was probably the best, because it was basing like upon like, namely, the computation of capital. Some people would say that they did not want the amount of wealth for any particular purpose but wanted the absolute amount of wealth. He would point out to those who took that view that it was very difficult indeed to say what they meant by absolute wealth. To be absolute they ought to include the wealth of roads, bridges, and even rivers, but this would be very difficult. Therefore, much as they would like to have it, he ventured to suggest that the idea of absolute wealth was one which it was impossible to realise, and that the source of obtaining results should, if possible, be the same as the purpose for which the figures were to be obtained. An estimate of the post-war wealth of the country was of the very greatest importance for the purposes of taxation in the future. Whether they attempted to obtain an annual revenue to meet the liabilities of the country, or whether they attempted to adopt the proposal which he favoured very strongly, namely, the levy upon capital, he thought it was quite clear that the wealth in private hands had very largely increased during the war, provided they included the private holdings of war debt but did not include among private liabilities the obligation for payment of the debt which was at present a corporate liability. Ultimately, it was on the assets of individuals that the debt would have to fall, whether on capital or on income, but at present it was not divided up.

He would hesitate to place the increase of private wealth as high as Sir George Paish had done. There was an amount to wipe off for internal loss in the shape of deterioration in property which (apart from price changes) he would put certainly at not less than 1,000 millions. He also thought that the amount of the War Loan held by the banks should be taken into account. There was also the vexed question of the appreciation of capital. The fact was that although the price of commodities had increased to an enormous extent this was not reflected at any rate to the same extent in the increase of price of capital. Whether it would be so in years to come when all capital tended to come to a supply value, as well as a demand value, remained to be seen. It was, therefore, very difficult to judge. It seemed to him that some kinds of capital had increased and some diminished, and it was rather guesswork on which side the balance lay. Personally, as an advocate of a levy on capital, he would be glad if the figure proved as high as Sir George Paish had put it, but he did not think it could, and he preferred to take a more conservative estimate. He should not like to recommend the proposal on the ground that it was going to produce a larger sum than he honestly believed in.

Mr. J. E. Allen said he supposed when discussion wandered from the subject of the Paper, it was really the most sincere compliment to the reader, as the speakers found that they could not pick holes in what the reader had said. That was his attitude, and he felt sure when Mr. Pethick Lawrence rose from his seat that they would have something in the way of controversy. Mr. Lawrence maintained that the amount of privately held wealth had largely increased as a result of or during the war. That seemed to him an extremely controversial statement, and was one with which he entirely disagreed. He was not certain what had happened to the aggregate amount of private wealth during the war, nor was he at all certain as to what was the meaning of the war debt. He thought it would be an excellent subject for the Society if someone would try and explain to them what was meant by the war debt, and what really happened, for instance, when the Chancellor of the Exchequer floated a big loan for, say, 1,000 millions. It seemed to him that after the loan was floated the country was not 1,000 millions poorer, nor, on the other hand, was it 1,000 millions richer; putting on one side subscriptions by or sales of securities to foreigners the amount of wealth was exactly the same before the emission of the loan as it was after its emission. He would like to have had the opinion of Professor Edgeworth on that point. His own idea was that when a loan of that magnitude was issued, what really happened was that all the wealth owned by private persons or institutions in securities was watered to that extent—that if they had before the loan securities worth 10,000 millions, after the loan had been issued those securities were only worth something a little over 9,000 millions; that was to say, the effect of borrowing by the Government for non-productive purposes was to make a levy upon the owners of certain kinds of existing wealth. He could not say whether that was so or not, but he was inclined to that opinion.

Mr. J. SORLEY said that the present fluctuation in values was strongly brought out in the estimate of the total war damage in Northern France. The claim amounted to 12,000,000,000*l*., or approximately the value calculated for the total pre-war wealth of France. The calculation showed the difficulty of valuing a country's wealth, and the great alteration in values since 1914.

The CHAIRMAN said, before putting the vote of thanks, he wished to say how very important he thought Dr. Stamp's contribution to the subject had been. The Society might congratulate itself on having had, within a single session, two addresses on topics connected with public finance—the President's, and the one they had heard tha evening—which he thought no Chancellor of the Exchequer could afford to neglect. A survey of that kind was one of the utmost value at the present time, when so many wild estimates were flying about, and he thought they would agree that Dr. Stamp had enabled them to feel confidence in the pre-war estimates which had been put forward; and that they made a most valuable starting point for investigations as to estimates of the present wealth and income which were so essential for taxation and other purposes. He hoped that the Paper would have the effect of stimulating further investigation on the subject. Dr. Stamp's discussion of the methods of valuation would be of great interest and importance if any such further investigation took place, and that was the part of the Paper which interested him most. He thought that Dr. Stamp would be the last to say they had reached finality in these questions: the discussion had shown that there was still some confusion, for instance, as to the way in which national debt should be treated. Dr. Stamp had alluded to this in his Paper and also in the articles in the *Economic Journal* of last September. But he would be glad of a little more light on the question of how this debt really affected the aggregate of privately owned wealth, which was the crux of the matter when it came to considering proposals for a capital levy. It was a very important matter in the pre-war estimates, but it had now become vital, and if one looked at the various estimates which had been made during the last year by, for instance, Mr. Pethick Lawrence, Mr. J. E. Allen, Mr. Sydney Arnold, and Dr. Stamp, he thought one found there was always some difference in the method in which the estimate had been made, which largely accounted for the very great divergences in the total figure reached. He only alluded to this in order to emphasize the point that he thought further expert enquiry into the matter was essential. It seemed to him that it would be quite useless to begin discussing the expediency or otherwise of a capital levy until they got some agreement both as to the principle upon which an estimate of privately owned wealth should be made, and as to the existing amount of the wealth which would be subject to such a levy. His (Sir Bernard's) own estimate from estate duty statistics had generally been assailed on account of the disappointingly low total brought out. This did not greatly disturb him, as he thought there was much greater inconvenience in the inflated and exaggerated estimates which were so prevalent; but he had been consoled by Dr. Stamp's comments upon this estimate, and by the fact that Dr. Stamp's estimate of pre-war wealth in private ownership in the *Economic Journal* article referred to, which, if he was not mistaken, was in the neighbourhood of 11,000 millions, was almost exactly the amount he himself had arrived by his multiplier calculation.

A vote of thanks was passed unanimously to the author.

Dr. STAMP, in reply, thanked them for their vote and said he would reply briefly on the chief points made in the discussion. Sir Felix Schuster had referred to the question of national and local loans and as to whether they had been deducted in arriving at the figures in the table. He (Dr. Stamp) had purposely not elaborated the methods of arriving at the British figures under discussion, because his views had been stated at length in "British Incomes and Property" and in the *Economic Journal*. If anyone turned to that volume they would find that many of the questions raised that night had been dealt with there. The national and local loans had been deducted from the value of the Municipal and State property. Having first been put in as individual wealth in the hands of the people they had then been treated as a mortgage on the communal property, and this he thought was the most satisfactory way of dealing with it. There was a plus balance of value in State property in pre-war days, but dealing with it now there would be a minus quantity. With regard to Mr. Allen's question as to whether there was any increase of wealth on the floatation of a loan, the answer was that there had been merely a redistribution of wealth. That meant that one class of wealth apparently went up by 5,000 millions or 10,000 millions, which was added under one head, but it had to be taken off at another place before they got their total valuation. When they came to a valuation for a capital levy it was otherwise. There the individuals who held the War Loan had to be taxed on that, the same as everybody else, and therefore we might get a larger gross figure liable to a capital levy than the net capital valuation of the country as a whole. It was quite certain that at the present moment there would be a minus quantity for State property on this method. Sir Felix had regretted that he (Dr. Stamp) had not put in any material with regard to India. He had looked at it carefully, and had found the figures so very diverse and nearly all from polemical literature, which it was so difficult to assess, that he had left it out of the paper. He hoped that it would be found by the present Commission which was sitting on the subject of income tax that taxation at the source, which Sir Felix thought was near its deathbed, would have a new lease of life and would be found to be compatible with universal individual statements of income. He thought that would be the only satisfactory result for any Chancellor, and he was sure some way would be found of dealing with it. Sir Felix had also dealt with the efficiency of the income tax, the question of evasion, &c. There were a number of people present who could speak effectively on this, but he had dealt with it in "British Incomes and Property," and had shown what he regarded as the net figure to be added to income tax totals for evasion. Even in the inventory method it was, as far as possible, only the net State property which had been added. The external debt did not come in amongst the assets of individuals, but it did come off the assets of State property, and therefore it served to lessen the total valuation. Sir Felix had made an interesting suggestion that they ought to be able to add to those figures some estimate of the effort put forward to realize them: that was the human horse power per pound of income, so to speak. One might find an equal number of hours perhaps, but one would have to think whether they were "brain-hours" or "hand-hours," and be up against the extraordinarily controversial and difficult problem of how to compare the hours put in by a miner with those put in by a civil servant, a statesman, or an ordinary professional man. They would have to take some unit like 30 as representing the proper effort of a miner and compare it with, say, 10 for a Cabinet Minister! Sir George Paish had said that his estimate of capital invested abroad was rather different from his (Dr. Stamp's). It was not actually mentioned in the Paper and could not be ascertained from the mere inspection of capital items, because a large sum was included under "companies" for those in the City, for example, which had mines abroad. But when he had worked it out with care for the *Economic Journal* he came to a figure which was near enough to that obtained by Sir George. There had been a great deal of confusion between the national wealth he had been dealing with and the wealth which would appear upon returns for a capital levy. Although he had 14,500 millions as the national wealth, he had shown in the *Economic Journal* that the figure which would have come out before the war on the returns for a capital levy would have been in the neighbourhood of 11,000 millions. There was a vast difference between what came out on personal returns for a levy and what came out on a total valuation. It was obvious that all the vast wealth held in the reserves of companies was only partially reflected in the value of the shares, and there were many other forms in which it would not come out to individuals. He had made an estimate of the present amount of wealth, or rather, an estimate before the war was over, of 16,000 millions as being the post-war sum returnable by individuals, so that it had gone up by 5 millions. The amount of the War Loan could not be taken at its full value because there were enormous collective holdings which were not reflected to the slightest extent in the individual shares. The only person who had criticised his post-war figure was a friend who had gone into it carefully, judging all the facts, and had said that he had put it too high rather than too low. He thought Mr. Allen had shown in his recent book that there was a very large drop in the value of many forms of capital. All the debentures and preference shares were diminished by the very fact that the market rate of interest had risen. They had a very large amount of capital which had to be put at a lower figure now than before the war. He thought that Sir George Paish should make more allowance for this factor. The question had been raised as to whether he had included the value of roads. He would read a passage from "British Incomes "and Property" on the point. "It can be argued with great "force that the greater part of the value of roads is already "included in the value of adjacent property. In so far as "the property is directly served it is enhanced in worth by the "present value of the services rendered by roads which have been "made and paid for in the past. One need not belong to the school "of thought which expects a cheaper 'hair cut' to work out into an "increased ground rent before one admits that, so far as minor "roads are concerned, their value must be mainly in the rents paid "for the houses, &c., served. There is very probably a surplus or "national value over and above the individual values in main roads, "taken as a system, and an estimate is permissible on that account. "Of course, it is open to argument, that all individual values are "improved by common wealth such as parks, but it is improbable "that the connection is so direct and full as in the case of sewers, "for example. In the case of recent expenditure (for the sake of "argument assumed to be outright) where rate of interest on outlay "is a controlling feature, the tenant's rent must cover streets and "sewers as much as it does the brickwork of the houses itself. In "the case of expenditure long past, where actual outlay has ceased "to command a rate of interest, we may consider a streetless, "sewerless house with poor situation, as upon the economic margin, "for which no site rent is payable, and contrast it with a similar "structure fully equipped, commanding a superior rent and a "distinct site rent. It is difficult to escape the conclusion that a "large part of public expenditure serving specific properties must "be valued in the valuation of those properties." So it would be seen that a valuation had been included for a surplus value in the main roads system apart from the ordinary town roads. In the *Economic Journal*, in reckoning the national capital at the end of the war, he was not reckoning what the real worth of the country was in terms of any other period. He was asking what was the face value of the wealth which would appear on individual statements of total wealth. When they came to ask what the real wealth of the country was, he was completely with Mr. Allen that it had not been increased, though as a statement in pounds, shillings, and pence, it might have done. What actually happened when a loan was floated, it seemed to him, if he might digress, was that if the loan was really provided to the Government out of the savings of the nation, they then got what he might call a charge for interest on every taxpayer. If it had been allocated as an interest payment to someone else, it would have reduced their income from 400 millions to 350 millions or 50 millions per annum. But under taxation instead of interest they would still call their income 400 millions, but the net effect was that it reduced their income by 50 millions and increased somebody else's income by 50 millions. In so far as that was not provided by a genuine saving but was an inflation of currency, it was obtained by the Government depreciating everybody's purchasing power. The inventory method tended to be lower in its results than a valuation as a going-concern—the capitalization of profits—if a country were prosperous because there was a large element of goodwill constantly, on the rise. On the other hand, the capital valuation, quite in the American form, was not merely a valuation of so many years' purchase of an existing profit, but it had also got a future site value in it. The inventory methods therefore tended to have larger values than a going-concern if the site values were increasing. The two together perhaps might tend to cancel out. With reference to what Mr. Pethick Lawrence had said as to the time "lag," in "British Incomes and Property" he had shown the point of time to which an income tax assessment might be said to relate. They would notice in his table he had raised the figure from 14,300 to 14,500 millions, for that very reason, that he was trying to get the figure to what it stood in July, 1914, whereas his original estimate was some time in the financial year 1913–14; a date precisely fixed would rotate about January as a fixed point. He had added half a year's savings at the rate of 400 millions per annum. On the question of overlapping there was, of course, a tendency which could be seen in the process of investigating the inventory methods of other countries. The very first thing to get was the investigators' method of dealing with this. Supposing they took an investigator who was about to make up an inventory for this country, and found him taking the total capital of the companies quoted on the Stock Exchange, they knew at once they need not go any further with that man because they would see that he was not qualified for his task. They all knew that there was an immense duplication of capital, one company holding the capital of another, and so on. It was merely duplication and did not get down to real capital at all.

Some enquirers had put an enormous amount of work into this question of dealing with share values as contrasted with the real value which had been put into the business. As to statements with regard to damages and so on, it was one thing to talk about the pre-war wealth of the country and quite another to discuss the cost of making good anything at present prices. The latter might be easily three or four times as much, and if there were elements of exaggeration, to give a margin for beating down, it would not invalidate the work of the French investigators in arriving at 12,000,000,000*l.* as the pre-war capital of France. In conclusion, he thanked them for the kind attention they had given to his Paper, and hoped that he had dealt with most of the points which had been raised.

The following Candidates were elected Fellows of the Society :—

Anne Ashley.
Daniel Bailey.
Dorothy P. Etlinger, B.A.
T. E. G. Gregory, B.Sc. (Econ.).
Herbert Moore Jackson.

THE COURSE OF WOMEN'S WAGES.

By DOROTHEA M. BARTON, M.A.

[Read before the Royal Statistical Society, Tuesday, June 17, 1919, the Ex-President, Sir BERNARD MALLET, K.C.B., in the Chair.]

IT is now some years since women's wages have formed the subject of a paper before the Royal Statistical Society and although it requires some courage to handle it, after such masters as Professor Bowley and Mr. George Wood, yet it is so important and interesting a question and there are so few workers in the field, that I felt I could not refuse the invitation to make what contribution I could towards it. Professor Bowley succinctly summed up its difficulties in the only paragraph which he devotes to the question in his book on Wages in the United Kingdom written in 1899. He says :—" This " brings us to the very difficult question of women's wages—difficult " because the conditions have changed immensely during the " century, on the one hand the opportunities of fairly well-paid " work having developed, on the other the available supply of labour " having increased ; difficult also because so great a mass of women's " wages are not paid according to the unrestricted action of the " laws of supply and demand ; and difficult, finally, because the " records are so meagre." This paragraph is as true now as when it was written and the fact that immense changes are still taking place only adds to the difficulties. Yet although these difficulties make it impossible to arrive at accurate knowledge, and to draw up statistical tables, it may be useful to take stock of the position, to see what trustworthy material there is, and how much it can be made to tell us.

I have often observed that our knowledge of the industrial conditions of most occupations depends rather on their being in some way exceptional than on their intrinsic importance or interest ; it is the special rather than the normal which excites attention. For example, the sweated rates of pay to home workers occupy far more space in the literature devoted to the sewing trades than do the more adequate earnings of the workers in factories and workshops of whom there are ten times as many. Again, the controversy with the Trade Unions about the employment of women as compositors has diverted attention from the far more numerous and worse paid book-folders, sewers and other table-hands in the printing and book-binding trades. My aim in this paper is to show, as far as I can, what we know about the normal conditions of women wage-earners and to avoid the special cases round which discussion has centred from time to time.

In comparing wages, as in every other comparison, we must choose a common unit and reject all evidence which cannot be reduced to the same terms. I have decided in this paper to confine my attention to the average full-time earnings of women over 18 years of age. This plan has involved the omission of much that is of great interest, often indeed the greater part of the scanty records; yet in dealing with wages, no mistake is easier than to compare the incomparable. Further, in adopting the age limit of 18 years, we appear to neglect more than a sixth of all the "occupied" females; yet a large proportion of women are engaged in unskilled occupations, and in these a girl frequently reaches her highest earning capacity before the age of 18, so that a statement about the wages of adult women in these trades will tell us the wages of many girls as well. There is another more serious objection to confining attention to the full-time earnings of women, and one that cannot be met. Our interest in women's wages is not merely theoretical; we deal with human beings and seek to find how large a share of the world's goods individual women can claim. We would know whether, in return for a given amount of labour, women can enjoy a higher or a lower standard of life than in years gone by; can eat meat when before they lived on bread and tea; can buy new clothes when before they could only afford second-hand ones; can indulge in a newspaper, a club subscription, a holiday, when before food and shelter swallowed up all their earnings. Setting out, as we must, with such an aim, our journey is beset with many disappointments. In the first place women are seldom economic units dependent on themselves alone for their livelihood. When one remembers the immense labour expended by Professor Bowley and his assistants in trying to form some idea of the financial resources of the households of four selected towns,[1] it is idle to hope for such information about all wage-earning women. Statements of annual, instead of weekly, earnings would give us a far truer picture of women's economic position. But there are practically no data from which to compile them. Women's trades are no less seasonal than those of men, but as women hardly ever belong to Trade Unions paying unemployment benefit and have only recently come under the State's unemployment insurance scheme, there are no statistics on the subject. In the wage census of 1906 it was apparently considered impracticable to ascertain the annual earnings of separate classes of workpeople; the information collected was sufficient merely to calculate the average annual earnings per head in each industry and no distinction was made between male and female, juvenile and adult workers. On the other hand, we cannot measure how far women mitigate unemployment by the dovetailing of different occupations. In some cases this is done in the factories themselves: where jam and marmalade, potted meats and tinned foods, sauces and pickles succeed one another, and between them fill up all the seasons; in other cases, the women move from one factory to another and make now shirts, now blouses, now baby linen according to the supply of work; or again they work in a laundry part of the year and become charwomen or office cleaners for the rest of the time. Thus what we can know falls very far short of what we should like to know; and necessity rather than choice has imposed these limits on the scope of my enquiry.

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[1] *See Livelihood and Poverty*, by A. L. Bowley and A. R. Burnett Hurst.

Sources of information.

Chief among the sources of published information come the Board of Trade Wage Census of 1886 and of 1906. The 1886 Census gives full information only about the textile trades. The returns made by other trades contained very few women; this is particularly disappointing in the case of the clothing industry which then, as now, occupied a substantial proportion of women wage-earners. The earnings of only 1,648 women are recorded in the returns, compared with 691,441 women occupied. The 1906 Census is very much fuller; it includes all the important industries except domestic service and shop assistants, and deals in considerable detail with the textile and clothing trades. But it is not without shortcomings for our purpose. Considerations of space made it necessary to give totals where we should like details; the general heading "Other Women" contains in some instances more than half the women returned in a particular trade. Undoubtedly, too, the resulting wage-level is somewhat too high; for it is, as a rule, the firms paying the best wages who respond most readily to an invitation to disclose the secrets of their wages books, even in confidence. The census was compiled from data of thirteen years ago; thirteen years which have seen immense changes in the industrial world. Already before the war, the level of women's wages was beginning to rise by the gradual elimination of the lowest paid labour, and as a result of better education and organization. The war, by changing completely our standard of values, has made all pre-war figures out of date. Yet the 1906 Census is the foundation on which all later work must be built.

The collection of wage statistics (C. 5172) made by the Board of Trade in 1886 contains interesting information about women's wages for the previous fifty years in many trades, chiefly in the textile, pottery and metal industries. Most of the information was supplied by the Chambers of Commerce, and may therefore be considered fairly representative though probably tending, like the 1906 Census, to a level rather above the average; it deals on the whole with trades which are mainly men's and is, therefore, necessarily scanty as far as women are concerned.

The first inquiry made into the conditions of wage-earning women as a whole was undertaken by the Royal Commission on Labour in 1893. The reports of the Lady Assistant Commissioners cover a great variety of trades and are full of varied and valuable information. But they are difficult to use for statistical purposes; they are descriptive in form and deal with relatively few individuals. Thus, for example, in the case of such large groups of women workers as shop assistants, dressmakers and milliners, the evidence as to wages in London was obtained from 12 shop assistants and 3 employers, about 32 shops; from 9 milliners and 2 employers, about 16 firms; and from 12 dressmakers and 3 employers, about 26 firms. For the provinces, 19 shop assistants gave information about 63 situations; and 19 dressmakers, milliners and mantlemakers about 24 establishments. Wage statistics dealing with larger numbers were obtained in several places, but they are presented in a form which, although the best for the immediate purpose, makes them difficult to compare with other data.

After 1893 we have a number of reports on individual trades made privately by such societies as the Women's Industrial Council, and the Christian Social Union Research Committee, valuable because their evidence was impartial, but meagre because their means were limited. In the propagandist literature of Trade Unions and other societies can be found many scattered wage-statements. It is, however, doubtful whether time spent in searching them out is well repaid; for where there are no standard rates any statement as to average wages made without wide enquiry can only be an expression of opinion; coming from a prejudiced source such a statement cannot be used without independent confirmation, which it is seldom possible to obtain. Some information can be collected from Government reports on kindred subjects, such as the Report of the Lords Committee on Sweating, 1888–90; the Select Committee on Home Work, 1907; the Home Office Committee on the Truck Acts, 1908;

and the Report to the Poor Law Commission on the Effect of Outdoor Relief on Wages, 1909. But in each case attention is concentrated on a particular section of under-paid labour, usually on home-work, so that we learn very little about the average full-time wages of an adult factory worker. An invaluable record of wages current before the war is contained in the handbooks issued by the Apprenticeship and Skilled Employment Association, and later by the Juvenile Advisory Committees of the Employment Exchanges. They are intended for the guidance of young persons, their parents and other advisers as to the prospects offered by different trades; the wages quoted have not the value of specially compiled statistics, but they were obtained by impartial officials and submitted for criticism to employers and workers. Even here I am inclined to think that the average given is somewhat high; for most women's trades were unorganized before the war and widely different wages were paid, so that the trade union officials and other representatives of the workers with whom the Government Department could get into touch were themselves ignorant of the lowest rates.

The most recent source of information is the Report of the War Cabinet Committee on Women in Industry (Cmd. 135), 1919, which appeared after this paper was practically completed. The Committee called witnesses from all the chief trades in which women are employed, and Part II of the majority report summarizes the evidence received. Enquiries of this kind can never take the place of a wage census. If the resources of the Committee and the somewhat ambitious chapter headings of Part II arouse the expectation of finding a storehouse of all the recent facts about women's wages, readers will soon find that the Committee was perforce content with such statements as their witnesses could give. From this method nothing approaching completeness can be expected. The mainstay of the report is still the 1906 wage census, supplemented for more recent years by standard and minimum rates, by estimated averages, and by particulars from individual firms. The closer supervision by Government Departments, the concentration of workers in larger groups, improved organization and more numerous wage agreements have furnished far more information for the war years than for the period 1906–1914. As the statements are usually of a general nature, comparison with earlier data is seldom possible.

To explain fully the reasons for the scantiness of our material, and particularly for the absence of those continuous records, so dear to statisticians, would lead me to discuss the whole question of the economic position of women wage earners, and cannot be attempted here. Its immediate cause is the small part which women have played in the trade union movement; for this means that there is, as a rule, neither a standard rate to be known, nor a permanent repository of facts, in the person of the trade union official, to be questioned.

Thus, although we have plenty of interesting and trustworthy data, they are too detached to be combined into statistical form or to yield clear-cut generalizations. We must content ourselves with discerning tendencies and noting changes in the limits within which wages vary.

Choice of trades for discussion.

But even so the field is wide. I have, therefore, decided to omit all reference to two large groups of women workers, the clerks and the teachers, although they are distinguished from industrial women by superiority of status rather than of earning capacity, so that their remuneration is determined by somewhat different factors. I must also deal more briefly than their numbers might seem to require with the two largest groups of employed women, namely, domestic servants and textile workers, and for two opposite reasons.

I have dealt with the chief remaining women's occupations by giving fuller treatment to four of them, namely, agriculture, shop assistants, printing and bookbinding, and the sewing trades, leaving the rest to be touched upon in the final section. Many different reasons have prompted the choice. The work of women on the land has aroused much interest lately, but there are few occupations about the normal conditions of which so little is known; nor can it be included in generalizations relating to industrial work; it seems worth while, therefore, devoting special attention to it in spite of the comparatively small number employed. Shop assistants form a large and growing group of women workers, in whom we are naturally interested on account of the personal intercourse we have with them. Yet, here again, our knowledge is meagre, and its accuracy difficult to test. In neither of these occupations have we the Earnings and Hours Report to help us. The paper and printing trade has been chosen partly because it is a typical semi-skilled trade for women, the average wage of a full-time woman being about the mean wage of semi-skilled workers, partly on account of some interesting records which we have of it. The sewing trades deserve attention because, if we except domestic service and the textiles, they are and will undoubtedly remain the most important women's trade, and because, owing to their wide distribution, they set the standard to a very large extent for women's wages in other occupations.

Domestic service.

About domestic servants as a body we possess remarkably little information, although we have an intimate acquaintance with individuals among them. Except Miss Collet's Report, published in 1899, on the Money Wages of Indoor Domestic Servants (C. 9346) dealing with 5,338 female domestic servants during the years 1894–98 and a note by W. T. Layton in the *Statistical Journal* for September, 1908, on Changes in the Wages of Domestic Servants during fifty years, I have not been able to discover any recent statistical data. We do not know the numbers employed in each of the many different kinds and grades of service, how many are cooks, housemaids, nurses, laundry maids; how many are single-handed or work with from one up to ten or more others; again, if single-handed how many belong to that superior class of person known as working housekeeper, and how many, at the opposite end of the scale, as grimy little "generals," do the work which is too heavy or too dirty for their mistresses.

Another problem connected with changes in the wages of domestic servants is that of their board and lodging. The money value of the food provided in part payment has certainly increased with the recent rise in food prices; but we do not know whether the food supplied has the same real value as before, or more or less. During the war the necessity of keeping within limited rations of some foods, and the general shortage of supplies has reduced the quantity of food available; yet, on the other hand, in many households the distinction between the food eaten in the dining room and in the kitchen has practically disappeared. Possibly these two factors cancel each other, and the rise in food prices may represent fairly accurately the rise in terms of money of that part of a servant's wages. The problem of the value of the lodging supplied is equally difficult. More stringent building regulations and the short supply of servants have decidedly improved the accommodation, as was proved by the difficulty before the war of letting private houses with basement kitchens. Yet, on the other hand, pressure of space in large towns led, especially in London, to the building of many blocks of flats in which the servants' bedrooms and the kitchens are as small, dark and undesirable as those which had ceased to exist in private houses. They are accepted for the frequent outings, the companionship and the other advantages made possible by flat life. There has also been a large increase in the number of daily domestic servants, whose wages are assessed by a different standard to those of resident maids: and so the problem is still further complicated.

There is, moreover, an interesting psychological fact which I have noticed in every discussion of domestic service; it appears to be almost impossible not to draw general conclusions from personal experiences; one's own and those of one's acquaintance are usually sufficiently varied to afford some excuse for thinking them universal; yet however wide they may be, they cannot be a safe guide in describing the conditions of one and three-quarter million women, working either as individuals or in very small groups. We could only obtain a true view of the position by an elaborate and extensive enquiry, which does not appear to be worth undertaking. For the shortage of servants enables them, as a rule, to obtain the redress of grievances which in other industries are the usual origin of investigations and statistics, while the intimate knowledge which we possess of that form of domestic service within our experience dulls our interest in the many other forms, of whose existence we are ignorant, or oblivious.

To throw some light on the wages question I have placed side by side Miss Collet's table of the average money wages of indoor domestic servants at selected age periods for London and for England and Wales excluding London, and the schedule of minimum wages issued by the Women's Legion for the use of their members taking situations in London, the London district and the Midlands, and labelled with emphasis "subject to revision."

Money wages of indoor domestic servants.

Class of work.	1894–98. *Average* wages at selected age-periods.					January, 1919. *Minimum* wages of Women's Legion in London, and London District, Midlands.	
	Age-period. Years.	London.		England and Wales, excluding London.			
		£	*s.*	£	*s.*	£	Increase per cent. in London.
Between maid	19	12	8	10	14	16	29
Scullery maid	19	13	14	13	0	18	31
Kitchen maid	20	16	12	15	0	20	20
General	21 and under 25	14	18	14	12	26	75
Housemaid	21 ,, 25	17	10	16	4	26	49
Nurse	25 ,, 30	21	0	20	2	30	43
Parlourmaid	25 ,, 30	22	4	20	12	30	35
Laundrymaid	25 ,, 30	27	6	23	12	30	10
Cook	25 ,, 30	21	16	20	4	28	28
Lady's maid	30 ,, 35	28	2	24	14	30	7
Housekeeper	40 and upwards	34	6	52	4	50	46

With regard to the change in the value of board and lodging, I merely record the fact that for many years before the war 10*s.* a week was the usual sum paid to servants when they had to provide themselves with food, and that it is now usually 15*s.* One of the recent scales of wages, drawn up by persons anxious to make the occupation more popular, mentions the sum of 25*s.* as being the value which board and lodging as part of the wages ought to possess.

The textile trades.

In dealing with the women in the textile, and particularly in the cotton trade, we are faced with opposite difficulties. In contrast with the absence of statistical data, we are completely buried under a mass of figures dating back to the end of the eighteenth century, and still accumulating. Instead of the first-hand knowledge which we all possess about domestic service, we become involved at once in the details of one of the most technically intricate trades in the world. To deal with them armed only with superficial knowledge would merely amuse the expert and mystify the layman. In order to give some idea of the changes which have taken place, I, therefore, seek safety in quoting the average earnings for full time for the years 1886 and 1906, given in the Earnings and Hours Report for the Textile Trades (1906); and the account of the war time changes is also based wholly on official figures.

Average weekly earnings for full time of all females.*

	1886.		1906.		Percentage increase (+) or decrease (−).
	s.	*d.*	*s.*	*d.*	
Cotton	13	4	16	9	+ 26
Woollen and worsted	11	7	12	9	+ 10
Linen	8	2	10	2	+ 24
Jute	9	1	12	10	+ 41
Silk (Lancashire and Yorkshire and the Congleton, Leek and Macclesfield district)	9	4	10	9	+ 15
Hosiery	13	0	12	7	− 3
All textile industries, except lace, hair, fustian cutting and bleaching, printing and dyeing, for which industries sufficient details were not obtained for comparison	11	7	14	3	+ 23

* Counting two half-timers as one full-timer.

I have endeavoured to summarize the changes in the chief women's occupations in the textile trades during the war in the following table. The five selected processes each employ twice as many females as males. Together they contain more than half the women and girls occupied in textiles in England and Wales. From the figures published monthly in the *Labour Gazette* the average earnings in these processes have been calculated. The columns headed (1) in the table show the percentage variation in these earnings, compared with the average earnings during the first six months of 1914, which are placed at the head of each column. These earnings do not, of course, represent the women's wages; for the average is based on wage returns of men and young persons as well as of women. Yet, as the occupations have been altered but little as a result of war conditions, and as women taking men's places have been paid men's rates, if not men's earnings, the changes in the average earnings are a rough measure of the changes in individual earnings. The columns headed (2) contain the percentage increases in rates of wages which have been agreed upon by the organizations of employers and workpeople.

We see from the table that the fall in earnings at the beginning of the war lasted longest in the cotton and worsted weaving trades, which were the least affected by Army clothing contracts, while recovery was most rapid in woollen weaving and hosiery, in which many firms could supply Army goods without any change in their own organization or in the specification of the goods.

In these, as in other trades, no substantial increase in wage rates took place until the cost of food had almost doubled, although actual earnings outran the increase in rates, particularly in the hosiery trade and in worsted spinning, which employs many juveniles at low wages. In cotton weaving there is a remarkably close correspondence between the changes in earnings and in rates of wages. But the figures do not show the loss of earnings through unemployment nor all the loss through working short time. When, owing to the shortage of raw material in the autumn of 1917, the Cotton Control Board ordered nearly 40 per cent. of the machinery to be stopped, under the rota system workers "played off" one consecutive week in every four, and the out-of-work pay granted was only 15*s*. a week for adult women, raised to 18*s*. in August, 1918. The real wages of cotton weavers have certainly fallen during the war.

In the woollen and worsted trades organization of employers and workers and standardization of wages have increased rapidly during the war, with the result that the women in these trades are undoubtedly

Changes in rates of wages and in earnings.

	Cotton Weaving.		Woollen Weaving.			Worsted.		Hosiery.		Per cent. increase in Retail Food prices on first of succeeding month.
	(1)	(2)	(1)	(2)*		Spinning. (1)	Weaving. (1)	(1)	(2)	
Average earnings first 6 months, 1914	19s. 4¾d.		17s. 6d.			12s. 4½d.	18s. 9d.	16s. 6½d.	..	..
1914, August ..	− 31	..	− 17			− 24	− 13	− 14	..	10
October	− 23	..	+ 12			− 2	− 9	+ 3	..	13
December	− 16	..	+ 11	..		+ 4	− 2	+ 3	..	18
1915, February	− 3	..	+ 13	..		+ 5	+ 1	..	..	24
April ..	+ 3	..	+ 17	+ 5		+ 10	+ 9	+ 5	..	26
June ..	+ 2	..	+ 17	..		+ 10	+ 10	+ 15	8½	32½
August ..	+ 5	..	+ 17	..		+ 12	+ 10	+ 18	..	35
October	+ 6	..	+ 16	..		+ 16	+ 12	+ 16	..	41
				+ 7½						
December	+ 4	..	+ 17	..		+ 16	+ 11	+ 11	..	45
		+ 5								
1916, February	+ 10	..	+ 21	..		+ 18	+ 16	+ 17	..	48
April	+ 14		+ 22	..		+ 24	+ 17	+ 17	..	55
June ..	+ 9	..	+ 23	+ 15		+ 34	+ 23	+ 17	..	61
August ..	+ 12	..	+ 23	+ 25		+ 25	+ 22	+ 23	..	65
October	+ 16	..	+ 24	..		+ 38	+ 27	+ 22	..	78
December	+ 11	..	+ 27	..		+ 45	+ 37	+ 18	12½	87
		+ 10								
1917, February	+ 17	..	+ 37	..		+ 51	+ 36	+ 22	..	92
April ..	+ 20	..	+ 42	..		+ 60	+ 42	+ 35	19	98
				Time Workers	Piece Workers.					
June ..	+ 19	..	+ 36	50	42½	+ 43	+ 39	+ 37	..	104
		+ 20								
August ..	+ 28	..	+ 40	..	..	+ 51	+ 37	+ 36	..	106
October	+ 28	..	+ 49	60	51	+ 63	+ 46	+ 40	..	106
December	+ 48	+ 35	+ 56	..	..	+ 75	+ 66	+ 52	31	106
1918, February	+ 35	..	+ 63	..	..	+ 75	+ 58	+ 57	..	107
April ..	+ 40	..	65	72½	61	+ 84	+ 70	+ 61	..	107
June ..	+ 54	+ 60	+ 81	..	..	+ 102	+ 84	+ 62	41½	110
August ..	+ 50	..	+ 83	81¾	69½	+ 113	+ 91	+ 72	..	116
October	+ 62	..	+ 89	..	..	+ 115	+ 99	+ 68	..	133
December	..	+ 110	+ 101	104¾	89	+ 129	+ 117	+ 84	54	130
1919, February	+ 105	..	+ 94	..	..	+ 133	+ 104	+ 77	..	120
April ..	+ 94	..	+ 213	†	†	+ 145	+ 128	+ 86	..	107

* The increases up to June, 1917, apply to the Huddersfield district only; those after that date to the whole woollen weaving trade and also to worsted spinning and weaving.

† Hours reduced from 55½ to 48, and rates increased where necessary to bring weekly earnings up to same amount as before change of hours.

better off. The increase in earnings shown in the table is greater than in the cotton and hosiery trades; the advances in wage rates started earlier and were higher than all others until the latest cotton advance. By the award of February 18, 1919, a minimum wage for all women is fixed at 17*s.* a week of 55½ hours, compared with an average of 13*s.* 10*d.* in 1906. To this a war bonus fixed on a sliding scale according to the cost of living must be added. This bonus now stands at 104¾ per cent., making a total minimum wage of just under 35*s.* Piece-workers' rates were so fixed as to yield at least the same sum. In March, 1919, hours were reduced from 55½ to 48 per week, without any alteration in time-workers' wages; 15·625 per cent. was in most cases added to piece rates to bring them up to the same amount. Standard wages for weavers have also been agreed for many districts, varying from 19*s.* to 21*s.* 6*d.* a week, with the war bonus in addition. The recent award contains a rather elaborate arrangement for bringing districts with unduly low rates into line with the better-paying districts. Altogether the woollen and worsted trades are an interesting example of the advantages secured by women workers through improved organization, and would well reward closer study.

In the hosiery trade the war bonus has throughout been low, amounting even now only to 54 per cent., as compared with 110 per cent. in the cotton and 104¾ per cent. in the woollen and worsted trades. But the increase in average earnings has outrun the increase in rates, in spite of the entry of a large number of women into the trade, of whom only about a quarter took men's places and therefore received men's rates. The effect of this has no doubt been counteracted by steady employment and the overtime due to the increasing demands on the trade from the British and Allied Governments.

Agriculture.

The number of women employed in agriculture in England and Wales was in 1911 just under 95,000, 2 per cent. of the occupied women, and only 38,000, or less than 1 per cent., if we exclude the very uncertain class of "farmers' relatives assisting" who form more than half the total, and account for the unexpected increase in numbers between 1901 and 1911.

The war has made great changes both in numbers and earnings, but the conditions of the work make strict comparisons impossible. In the first place, farm wages are sometimes paid partly in kind; this form of payment is less common with women than with men, and very rarely consists in anything but board and lodging; the value of this has now been roughly standardized by an Order, dated

February 4, 1919, of the Agricultural Wages Board, determining the value of certain "benefits and advantages" which alone are allowed to count in lieu of money wages. A far greater difficulty is presented by the variation in the number of women employed, in the time they work and in the wages they receive. The extent of women's casual labour on the land is indicated by the figures for Great Britain prepared by the Board of Trade (Industrial Enquiries) Branch during the war.

Year.	Permanent women.		Casual women.		Total Number.
	Number.	Per cent. of total.	Number.	Per cent. of total.	
1914	80,000	61·5	50,000	38·5	130,000
1915	62,200	51·5	58,000	48·5	120,200
1916	98,700	52·5	90,000	47·5	188,700
1917	106,100	54·5	88,500	45·5	194,600
1918	113,100	63·5	65,200	36·5	178,300

Again, reports from Board of Agriculture's inspectors during the war show that in certain counties for which figures are available 80 per cent. of the village women who worked gave part time only.[1]

The Board of Trade figures just quoted show that if the permanent and casual women land workers be taken as 100 in 1914, the following variations have taken place in Great Britain.

1914	100	1917	150
1915	92·5	1918	137
1916	145		

In Ireland a decrease of 17 per cent. of all women land workers is estimated. However, Lord Ernle told the House of Lords in March, 1919, no doubt in an optimistic moment, that the number of women working on the land had increased from 91,000 in 1911 to upwards of 300,000 (or by 230 per cent.). Clearly with such data precise statements cannot be hazarded.

Again, much of women's work on the land is paid for by the piece, the rates being in most cases the same as those paid to the men; weekly and even daily earnings are, therefore, very difficult to establish. The time-rates also show extraordinary variations, even in different parts of the same county. Miss Gladys Pott[1] quotes cases of Berkshire women known to her who were paid for hoeing 1*s.* 6*d.*, 1*s.* 10*d.*, 2*s.* and 2*s.* 4*d.* a day in different villages, and she had heard of a day rate of 1*s.* 3*d.* The number of hours per day worked likewise vary.

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[1] Report of Wages and Conditions of Employment in Agriculture, Cmd. 24, 1919, p. 53.

It is, therefore, not surprising that few people have had the hardihood to make any statements at all about the wages of women agricultural workers. Mr. Wilson Fox's reports, Dr. Bowley's statistics, all deal with men and boys only. Mr. Geoffrey Drage, in the Board of Agriculture's Report already quoted, puts forward with great diffidence some figures collected by his investigators, which show the following rough averages[2] :—

	1914.	1917 to 1918.	
	Wage.	Wage.	Increase per cent.
	s. *d.*	*s.* *d.*	
Weekly time wage	10 2¼	18 0	77
Daily time wage	1 11¼	2 10	46
Hourly time wage	0 2½	0 4½	80

The legal minimum rates of wages fixed by the Agricultural Wages Board for England and Wales, which came into force in October, 1918, are 5*d.* an hour for an 8 or 8½ hour day, with overtime of 6*d.* per hour on week-days and 7½*d.* on Sundays. In Yorkshire, Cumberland and Westmoreland, the rates are 6*d.*, 7½*d.* and 9*d.* respectively.[3] The women enlisted for full-time work into the Women's Land Army are paid at a somewhat higher rate which has been raised by successive stages from 18*s.* in 1917 to 25*s.* in the spring of this year. These substantial wage increases show that the isolation of women farm workers has to some extent broken down, and that the agricultural wages are influenced by the same factors which affect industrial wages, namely high prices, scarcity of workers, and competition with munition works, some of which, situated in the country, have had a very marked local influence on the wages of farm workers.

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[1] *Women's Industrial News*, July, 1916, p. 30.

[2] *Loc. cit*, p. 129.

[3] On June 3, 1919, a proposal was issued to vary these rates to 6*d.*, 7½*d.* and 9*d.* and to 7*d.*, 9*d.* and 10½*d.* in the three northern counties named; also to fix for whole-time workers employed by the week or any longer period a rate of 27*s.* per week of fifty-four hours in summer and of forty-eight hours in winter, with overtime of 7½*d.* an hour on week-days and 9*d.* on Sundays.

Shop assistants.

The shop assistants are a widely scattered and expanding group of wage-earning women, whom one is perhaps rather apt to overlook, when thinking of industrial women. Yet their numbers justify their consideration. Unfortunately the 1911 Census does not contain the name; it tells us, however, that there are about 233,000 "dealers working for employers," and excluding "employers" and "those working on their own account," there are further 80,000 of "Other or no statement," of which no doubt a large proportion are also employees. The Board of Trade (Industrial Enquiries) Branch estimates that there were in July, 1914, about 500.000 females engaged in commercial occupations, that is to say, "in "business houses and shops, wholesale and retail, engaged in dis"tributing goods, either as clerks, saleswomen or carriers." Deducting about 120,000 commercial and business clerks, we have a figure somewhere between 300,000 and 380,000 as the total of female shop assistants, or about 7 per cent. of the total occupied women.

The name, however, is a very elastic term, and covers every kind of shop and every class of assistant, from the stately saleswoman in the Bond Street showroom offering costly furs and luxurious dresses for eight hours a day, and drawing a salary of £200 a year, down to the little girl in the East End, fresh from school, handing out valueless goods over the counter of the penny bazaar and paid 5*s.* a week for a week of seventy-four hours. We have no means of estimating how many there are in each grade.

Again, the amount of their earnings raises many problems. The basis of their income is indeed a time-wage, but complications enter at once; board and lodging is often provided in part payment, which introduces the problems discussed in the section on domestic service; premiums or commissions on takings are paid in addition to salary, which involves the uncertainties of piece work earnings; a uniform has to be provided, which is sometimes a heavy charge on slender incomes. These conditions make information about their wages difficult to handle. We can find plenty of statements about the wages of individual assistants, but they are seldom sufficiently precise for comparative purposes. Shop assistants are not included in either of the official wage censuses. Miss Collet for her report to the Royal Commission on Labour in 1893 interviewed a few assistants in London and the provinces. Of the London assistants more than half were paid 20*l.* to 25*l.* with board and lodging; the highest wage quoted was 100*l.* without board and lodging in a shop in the Haymarket, the lowest was 15*l.* with board but without lodging in Mare

Street, Hackney. Of the twenty-one provincial assistants, who stated whether or not board and lodging was provided as well as wages, 13*l.* with board only is the lowest, and 50*l.* with board and lodging the highest wage, including premiums in both cases.

Miss Margaret Bondfield, herself at that time a shop assistant, spent eighteen months in a variety of situations in order to collect information about the prevailing conditions. Her estimate of the wages of an experienced assistant is 10*l.* to 30*l.* a year as salary, to which must be added 5*l.* to 15*l.* as premiums and the value of board and lodging, which the employers assessed at 25*l.* to 30*l.*, the assistants at 10*l.* to 15*l.* For the purpose of comparison with other employments, this may be taken to be roughly 10*s.* to 25*s.* per week, as holidays with pay are usual. Since that time there has been a great increase in the number of women at work in shops, although the increase has been smallest among drapers and grocers, including tea, coffee and chocolate dealers, where the largest number of women were already to be found. In 1915, the wage of an ordinary counter hand in a draper's shop living in, was from 15*l.* to 30*l.*, with from 5*l.* to 20*l.* in commissions.[1] This would suggest that a small improvement had taken place in the staple occupation of women shop assistants since 1893. Recent reports dealing with shop assistants of all kinds in London, who live out, show that in shops where very little skill was required, such as confectioners, tobacconists, dairies, greengrocers, fancy stationers, the wages were from 12*s.* to 15*s.* weekly, while the more skilled work of booksellers, grocers, chemists and florists could command a wage round about 20*s.* and even up to 30*s.* The Report of the War Cabinet Committee on Women in Industry (Cmd. 135, p. 63) quotes an employer in a large London store who paid the women 25*s.* a week, to which commissions of 7*s.* to 8*s.* a week were added; neither the part of London nor the nature of the goods sold is specified.

In the provinces the whole scale was lower. Messrs. Hallsworth and Davies in "The Working Life of Shop Assistants (1910)" quote wages from several provincial towns starting at 5*s.* or 6*s.* for unskilled work up to a maximum of 20*s.* for more skilled employees. A statement of wages paid to female shopworkers over twenty-one years of age, including manageresses and assistants, in 135 co-operative stores in Great Britain gave an average of minimum rates of 15*s.* 10*d.* and of maximum rates of 21*s.*

Already before the war the National Amalgamated Union of

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[1] See *Women's Industrial News*, April, 1915; *The Shop Assistant*, by Mrs. B. Drake.

Shop Assistants, Warehousemen and Clerks had drawn up a scale of minimum wages and started a vigorous campaign to secure its observance. The minimum rates for women of 21 and 28 years with four years' experience, or after six years' experience, was in 1913:—

	In London.		In the Provinces.	
	21 years.	28 years.	21 years.	28 years.
	s. *d.*	*s.* *d.*	*s.* *d.*	*s.* *d.*
Mantles	30 0	36 0	25 0	31 0
Jewellers	27 6	33 6	22 6	28 6
Drapery, china and glass, stationery and newsagents, fruiterers and florists, booksellers	23 0	29 0	20 0	26 0
Boots, hairdressers, tobacconists, confectioners	23 0	29 0	18 0	24 0
Deductions allowed for board and lodging	12 0		10 0	

These rates are about threequarters of those of the men in the provinces, and four-fifths in London. The Amalgamated Union of Co-operative Employees, which contains a great many shop assistants, had drawn up before the war a minimum wage scale fixing 17*s.* for a woman twenty years of age.

Although the absence of trade agreements on a large scale makes it impossible to give any definite figures as to the rise in wages during the war, there is no doubt that a marked improvement has taken place. The Shop Assistants' Union estimate that advances of between 25 per cent. and 50 per cent. have been obtained (Cmd. 135, p. 147). The minimum wage scale of the trade union has secured a wide observance, while special scales and war bonuses have been granted in addition. But even to-day some very low wages are still paid in some parts of the country; in evidence presented to the Minister of Labour the Secretary of the Shop Assistants' Union gives an average of 12*s.* a week as the result of a "rather wide "investigation" into the wages of women in the grocery trade, while forty-three cases of women over twenty-one years taken at random from some figures kindly supplied to me by the same union yield an average of 15*s.* 3*d.* a week; in none of these cases are board and lodging included.

A trade in which even isolated instances of such low wages are still to be found obviously calls for a legal minimum rate, and in fact one or more Trade Boards will be established under the Act of 1909 as soon as satisfactory subdivisions of the trade can be agreed upon.

Paper, printing, bookbinding and stationery trades.

The number of women and girls employed in these trades was in July, 1914, about 147,500 according to the estimate of the Board of Trade, and comparison with the decennial census figures show that it is an expanding trade as far as women are concerned ; however it still only contains less than 3 per cent. of the occupied females. The chief work done by women in these trades is rag sorting in paper making, folding, stitching and other "table work" in printing and bookbinding, and the making up of bags, boxes, envelopes, &c., in the stationery trade ; about half of these are cardboard box makers.

Paper making.

Although this is only a tiny trade, it may be of interest to give, as an example "in parvo," all the wage statements about women which I have been able to find. Considering the size of the trade, the evidence is decidedly above the average both in quantity and quality :—

	Rag sorting.		Paper sorting and finishing.
1841	Edinburgh	1*s.* 2*d.* (per day)	
1861	Edinburgh	1*s.* 4*d.*	
1863	Blackburn	3*s.* to 12*s.* piece work.	
,,	Glasgow	6*s.* to 8*s.*	
1867–8	Newcastle	7*s.* 60 hours.	
1880	London	10*s.* 6*d.*, 60 hours	Edinburgh :
	Edinburgh	10*s.* 6*d.*, 10 hours (per day)	1880 : Glazers and sorters, 10*s.*, 10 hours per day.
1883	Edinburgh	9*s.* 9*d.*, 57 hours	Finishers 12*s.*, 10 hours. 1883 : Finishers 12*s.*, 57 hours. Sorters 11*s.* 6*d.*, 57 hours.
	Greenock	7*s.* 6*d.*, 57 hours.	Greenock : Sorters, 9*s.*
	Aberdeen	9*s.*	Aberdeen : Sorters, 11*s.* Finishers 10*s.* 6*d.*

All the above statements are taken from the Board of Trade's Wage Collection C. 5172.

An article by Miss B. L. Hutchins on the paper making trade in the *Economic Journal* of June, 1904, is the result of an enquiry into the effect of factory legislation on women's employment. Wages are given with diffidence, but one can gather that in the factories visited in Herts, Bucks and Kent rag sorters' wages averaged 9*s.* to 12*s.*, and paper sorters, 10*s.* to 13*s.* Finally, there is the Earnings and Hours Report of 1906 :—

Average full time earnings of—

	Rag sorters.	Paper sorters (finishing department).
United Kingdom (56·9 hours)—	*s.* *d.*	*s.* *d.*
Time workers	10 1	11 2
Piece workers	10 11	13 3
Average	10 7	12 9
Scotland (57·7 hours)—		
Time workers	10 2	11 3
Piece workers	—	14 10
Average	—	12 10

with similar details for Yorkshire, Cheshire and Lancashire, and for the rest of the United Kingdom. All these figures are precise and reliable, and yet one hesitates to draw definite conclusions from them; the most that can be said is that the wages in Scotland show a tendency to rise.

Printing and bookbinding.

Women have long been working as folders and sewers in the printing and bookbinding trades, and although here again we have not enough material to erect an imposing edifice of statistics, yet we possess records which throw interesting glimpses on the lives of individual workers.

A general impression can be gained from Mr. George Wood's table in his Appendix on Women's Wages to the History of Factory Legislation by Hutchins and Harrison (first edition, 1903, pp. 278 and 9). He gives us the average wages of women and girls combined, (1) calculated on the basis of 1866 as 100; and (2) based on the average wage for 1886 given in the wage census of that year.

	Printing.		Papermaking.	All industries included in table.*	
	(1)	(2)	(1)	(1)	(2)
		s. *d.*			*s.* *d.*
1840	79	6 3	83	76	7 4
1850	83	6 6	83	79	7 7
1855	91	—	—	83	8 0
1860	94	7 5	96	92	8 10
1866	100	7 10	100	100	9 7
1870	108	8 6	—	108	10 5
1880	—	—	125	124	11 11
1883	111	8 9	128	125	11 9
1891	125	9 10	—	123	11 10
1895	125	9 10	—	125	12 0
1900	128	10 1	—	128	12 4

* N.B.—More industries are included in column (1) than in (2).

These figures are an interesting illustration of the principle that with a rise in the general standard of efficiency the wages in a trade which requires no more than average intelligence and dexterity tend merely to keep pace with the general increase in spite of temporary discrepancies. The story can be continued by the 1906 wage census :—

	Average full time earnings.		
	Printing.	Bookbinding.	Printing and bookbinding.
	s. d.	*s. d.*	*s. d.*
Women folders, gatherers and collators	14 4½	12 7½	13 3
Women sewers and stitchers....	12 10	12 4	12 5
All women	12 3	12 10	12 5
All girls	6 4	6 0	6 2½
All women and girls	9 10	10 2	9 11

Another series of figures for bookfolders and sewers in Edinburgh is given in C. 5172 :—

	s. d.	
1840....	7 0	60 hours.
1850....	7 3	60 ,,
1860....	8 0	60 ,,
1861....	8 2	60 ,,
1866....	6*s.* to 9*s.*	57 ,,
1880....	10 0	54 ,,
1883....	10 0	54 ,,

to which may be added from the 1906 census for Scotland :—

1906....	11 0½	50 hours.

The average of 11*s.* 9*d.* for the whole of the printing trade in 1886 is based on too small numbers, and is too composite to have any value for comparative purposes.

A more personal view of the women and their earnings is given in the study of "Women in the Printing Trades," prepared by a joint committee of the Royal Statistical Society, the Royal Economic Society and the Women's Industrial Council in 1904. There we find an account of the heroic fight in 1845 and 1850 between Mr. Dunning, the chivalrous trade union secretary, and Miss Watkins, who bound the Bibles for the British and Foreign Bible Society, over the wages of the women folders and sewers, which then averaged 5*s.* 6*d.* to 6*s.* a week. A very large number of weekly wage state-

Town.	Age or experience.	Date.	Wage.
London	18 years and over	April, 1918	Permanent wage of 29*s.* for 48 hours
		September, 1918	Permanent wage of 37*s.* for 48 hours.
Manchester and Salford	—	September, 1918	Increase of 4*s.* to 28*s.*
		April, 1919	Increase of 2*s.* to 30*s.*
Liverpool	In fifth year	August, 1918	23*s.* 9*d.*
	Journeywomen	May, 1919	Increase of 4*s.* to 30*s.*
Leeds	Qualified workers	October, 1918	Increase of 4*s.* 6*d.* to 24*s.* 6*d.*
	Two years' additional experience		27*s.*
Sheffield and Rotherham	21 years and over	October, 1918	Increase of 4*s.* to 26*s.* 6*d.*
		February, 1919	Increase of 3*s.* 6*d.* to 30*s.*
Huddersfield	Qualified workers	June, 1918	22*s.* 6*d.*
Bristol	Five years' experience	October, 1918	Increase of 3*s.* to 28*s.*
		January, 1919	Increase of 2*s.* to 30*s.*
Leicester	21 years and over and three years' experience	February, 1918	20*s.* and 4*s.* war bonus.
Coventry	Five years' experience or 21 years and three years' experience.	July, 1918	Increase of 2*s.* to 20*s.*, with 2*s.* 6*d.* war wage.
Norwich	Five years' experience	September, 1918	Increase of 4*s.* to 24*s.*
Ipswich, Cambridge and Colchester Lynn, Bungay, Beccles, and Fakenham.	Five years' experience	September, 1918	24*s.*
Other towns in Norfolk, Suffolk, Cambridge and Essex.	Five years' experience	September, 1918	22*s.*

ments, some of them dating back to 1885, were obtained for the purpose of the enquiry; but Professor Bowley, who undertook the chapter on wages, could hardly bring himself to make any general statement at all upon the subject. He found the work so irregular, the conditions of employment so varied, and the occupations so involved, that generalisation seemed to him impossible. However, he goes so far as to give an estimate of wages in a typical week in 1899 of 1,001 workers in all branches, which yields an average of 13*s.* 8*d.* Unfortunately this cannot be compared with the wages of London women given in the 1906 census, namely 15*s.* 8*d.*; for Professor Bowley, while excluding actual apprentices and learners, has included many workers under 18, and this, no doubt, accounts in part, at least, for the lower figure. The bookbinding section of the London Chamber of Commerce estimated that a woman's minimum in 1914 was 16*s.* (Cmd. 135, page 57.)

During the war the men's unions have insisted upon the rule of "men's work, men's wage," as previous history would lead one to expect, but very little substitution has actually taken place. Real advance has been made in one respect. In many towns scales of minimum wages have been established, according to which adult women receive at least the minimum rates shown in the table on the previous page.

The clothing trades.

The clothing trades, which in 1911 occupied three-quarters of a million women and girls, ranked second in numbers to domestic service, and exceeded the textile trades by nearly 10,000; as they employ fewer girls than do the textiles, the number of women over 18 engaged in them was nearly 600,000, as compared with 565,000 in the textile trades. But while present conditions in the latter make large mills the rule and home-work almost non-existent, in the former there are still a great many small businesses, home workers and individual women working on their own account; we must, therefore, make large deductions before we can estimate how many women over 18 there are earning full time wages in the clothing trades. Assuming that the column in the Occupation Census headed "Others or no statement," contains mainly employees, we must deduct 19,723 employers, 141,151 women working on their own account, 54,834 women working for employers at home, and 28,700 other women working at home; in all 244,408 women. This leaves us with 353,800 women over 18 working on their employers' premises in the clothing trade in 1911, a figure somewhat in excess of the numbers returned in the Census of Production of 1906, but remarkably close to the Factory and Workshop Returns of 1907, and to the Board of Trade's estimate of employed women in July 1914. About one-fifth of the persons engaged in the clothing trade work in London, a fact of some importance, as London wages are in many of these trades decidedly higher than those paid in the rest of the United Kingdom. This is very clearly shown by the following figures from the 1906 Wage Census :—

Average full time earnings of women over 18.

	United Kingdom.		United Kingdom excluding London.		London.	
	s.	d.	s.	d.	s.	d.
Dress, millinery, &c.—						
Workshop	13	10	12	9	16	9
Factory	15	5	14	9	16	7
Shirts, blouses, underclothing, &c.	13	4	12	7	15	10
Bespoke tailoring	14	2	13	10	16	2
Ready-made tailoring	12	11	—		11	11

This generalization does not hold good for the ready-made tailoring trade, much of which is carried on in Manchester and Leeds, where the wages are high owing to the proximity of the textile workers. The comparatively small numbers returned from London in both the tailoring trades make the averages less reliable than those for the other clothing trades. The dress, millinery, and shirt and underclothing trades offer the prospect of the highest wages to an ambitious girl, for here the cutting and fitting, the most skilled and best paid work, is often in the hands of women, while in tailoring it was, before the war, reserved to men ; and although the average wage for women in the bespoke tailoring trade is comparatively high, not many women are employed in this section.

Dealing first with dressmaking and millinery, we are faced with two, at least, of the usual difficulties—the wide range of skill and experience, and the absence, until recently, of any definite standard of wages except in the best West End firms. Our earliest information comes from the Labour Commission reports of 1893, the meagre nature of which has already been observed. Remarkable agreement is shown in the wages of experienced bodice hands in London, which are given in each case as 18*s.* In the provinces the wages of bodice hands are stated to be 9*s.* to 12*s.*, and never more than 15*s.* ; those of skirt hands, 7*s.* to 9*s.*, up to 11*s.* and 12*s.* In 1906 the average full-time earnings in the dressmaking, millinery, etc. (workshop), trade were :—

	United Kingdom.		United Kingdom, excluding London.		London.	
	s.	*d.*	*s.*	*d.*	*s.*	*d.*
Bodice hands	12	7	11	7	15	9
Skirt hands	12	3	11	2	15	7
Milliners	14	3	12	6	15	8

The higher average wage of milliners is due to the inclusion of head milliners, while women of the same standing in the dressmaking trade have been classified separately. In these trades there are also a small, though decreasing, number of women who live in, and receive comparatively high wages. In the report of an enquiry made by the London County Council into the dressmaking trade in 1907, the wages are said to be for junior assistants, 12*s.* to 14*s.*; for senior assistants, 18*s.* to 25*s.*; for heads of tables, 20*s.* to 30*s.* In 1914 the handbook of the London Juvenile Advisory Committee gives the wages of bodice, skirt and sleeve hands as 15*s.* to 22*s.*; and of heads of tables 25*s.* to 30*s.*; the Birmingham Committee quotes 15*s.* to 18*s.*, with a maximum of 30*s.* as current wages. These figures show no change in London wages since 1893, but a decided decrease in the disparity between London and the provinces owing to the levelling up of the latter.

During the war scarcity of workers has forced up wages, and led in several places to the adoption of a regular scale for learners, with a minimum wage for qualified workers. In October, 1916, London employers came to an agreement by which conditions of work were improved, especially for learners and juniors; qualified workers were promised 21*s.* to 30*s.* according to ability, and assistant charge hands 35*s.* to 40*s.*, often with meals in addition. Time worked in excess of 48 hours a week was to be paid for at rates roughly equal to time-and-a-quarter. A higher scale[1] has been drawn up by the Shop Assistants' Union for their dressmaking members, and has been accepted by some firms. In Edinburgh, according to an agreement made in July, 1917, skilled workers were to get 21*s.* to 30*s.*, with a minimum of 25*s.* for the head of a

	s.	*d.*
[1] For women of 18 years of age	19	0
For women of 19 years of age	22	0
For women of 20 years of age	24	6
For women of 21 years of age	27	6
Junior hands and machinists	32	0
Bodice, skirt and sleeve hands	36	0
Second hands	45	0

table. In Aberdeen a scale was arranged in May, 1918, by which a worker earned at least 24*s.* in her tenth year.

All the minimum rates have, however, now been superseded by an Order issued by the Minister of Labour, which came into operation on April 7, 1919, and covers all the women and girls in the clothing trades for which Trade Boards have not yet been established. This Order prescribes a rate of 7*d.* an hour (including 1*d.* war advance) for all women of 18 years and over, that is to say, 28*s.* for a week of 48 hours. Clearly a further levelling up will have to take place in the provinces; and London wages will also probably rise, in order to secure the exceptional qualities necessary for the best work.

Milliners' wages depend, even more than dressmakers', on the class of shop, and on the skill and taste of the individual worker. The figures available for London, which contains a quarter of the adult milliners, show no marked improvement in wages in recent years; they suggest, however, that higher wages are now possible at the top. In 1914 the earnings were stated to be: For competent hands, 12*s.* to 18*s.*; for first hands, 18*s.* to 25*s.*; for copyists, 25*s.*; for head milliners, 20*s.* to 50*s.* Here, again, the war has led to the introduction of a scale of minimum wages, rising to 6*d.* an hour after five years' experience, and to 7½*d.* an hour for first hands and copyists. This gives for a 48-hour week a minimum of 24*s.* to ordinary workers, and of 30*s.* to copyists and first hands, wages which show a remarkably small increase on the 1914 figures.

London is also the centre of the tailoring trade with one-quarter of the workers, followed by Leeds with one-eighth. There is here also an extraordinary variety of work, from the khaki drill shorts thrown together for South African kaffirs, to the dress suits skilfully fashioned before the war for all the crowned heads of Europe. For the best work 3*s.* 6*d.* a day, with a good deal of slack time, seems to have been for many years the normal standard, yielding an average of about 15*s.* to 18*s.* a week all the year round. On a very different class of work, the log drawn up in 1892 for the contract work of the London County Council gave 24*s.* a week to machinists and first-class tailoresses, and 18*s.* to second-class tailoresses for a 54½-hour week. At the Army Clothing Factory at Pimlico piece-workers earned an average wage of about 15*s.* during the years 1880 to 1892; the Wage Census of 1906 gives an average of 20*s.* 11*d.* for all adult women. The tailoring trade is also responsible for some of the lowest rates paid. Trouser finishers figure in every exhibition of sweated labour, and in every leaflet and report on the subject; but it is almost entirely the low piece-rates paid to home-workers which cause the outcry, and these have been excluded from this survey. It is, perhaps, significant that the average wage in ready-made tailoring for the London district, namely, 11*s.* 11*d.*, is far below the London average for the other sewing trades. It is not surprising, therefore, that ready-made tailoring was among the first four trades to be endowed with a Trade Board, which in August, 1912, fixed a flat rate of 3¼*d.* an hour for the whole of Great Britain, that is 13*s.* 6½*d.* for the normal week of 50 hours. At the same time the log rate in Leeds for women was 4*d.* an hour. This example is a striking warning against the error of comparing the minimum rate of one period with the average, or even the standard rate of another. The changes made in the legal minimum rate during the war are shown in the table of legal minimum rates; in addition, the Committee of Production has awarded three successive bonuses of 1*d.* an hour, so that the rate is now 8*d.* an hour. A rather higher wage was agreed upon for London in August, 1918, namely, 37*s.* 6*d.* for assistants and tailoresses, and 32*s.* for fellers. At a conference of the United Garment Workers' Union, held in Leeds at the end of April this year, it was decided to demand a minimum of 1*s.* an hour for all women over 18 years. These facts show clearly that the wage level in this trade is still fluctuating. It is, therefore, too early to say more than that wages appear to be now slightly more than twice as high as in pre-war days; that is to say, the women are a little better off than they were before.

Changes since the War.

It would be extremely interesting to trace step by step the rise in woman's wages in each trade since 1914; to see where and when it began, whether it has kept pace with the rise in prices, and to how much it has amounted. But, unfortunately, the material for such a survey is not at present available. Some of it, obtained for a variety of purposes by different Government Departments, is kept under the official lock and key; a great deal more remains to be collected. With the limited resources of a private individual I could not hope to achieve so ambitious an aim. I have, therefore, had to content myself with putting together such published information as I could collect, and drawing such conclusions as they appeared to suggest.

One of the most important facts is the change in the work which women are now doing. The following table shows the estimated number of women and girls employed in July, 1914, and July, 1918:—

*Estimated number of women and girls employed.**

Occupation.	July, 1914.			July, 1918.			Per cent. increase or decrease.
	Number.	Per cent. of total.	Order.	Number.	Per cent. of total.	Order.	
Metal....	170,000	3·4	—	594,000	9·4		+ 249
Government establishments	2,000			225,000	3·6		+ 1,115
All metal	172,000	3·4	9	819,000	13·0	4	+ 376·1
Chemical	40,000	0·8	13	104,000	1·7	13	+ 160
Textile	863,000	17·1	2	827,000	13·1	3	— 4·1
Clothing	612,000	12·1	3	568,000	9·1	5	— 7·2
Food, drink, and tobacco	196,000	3·9	6	235,000	3·7	7	+ 20
Paper and printing....	147,500	2·9	10	141,500	2·2	10	— 4
Wood....	44,000	0·9	12	79,000	1·3	14	+ 79·5
Miscellaneous	104,100	2·1	—	197,100	3·1	—	+ 89·4
All industries	2,178,600	43·2	—	2,970,600	47·2	—	+ 36·4
Commerce, finance, banking	505,500	10	—	934,500	14·9	—	+ 84·8
Professions‡	50,500	1	—	107,500†	1·7	—	+ 113
Civil Service‡ other than the post office	5,500	0·1	—	101,800	1·6	—	+ 1,751
Clerical work‡	561,500	11·1	4	1,143,800	18·2	2	+ 103
Civil Service: Post Office....	60,500	1·2	11	121,000	1·9	11	+ 100
Agriculture (permanent and casual)	190,000	3·7	7	228,000	3·6	8	+ 20
Transport, including tramways under local authorities	18,200	0·3	14	117,200	1·8	12	+ 544
Other services under local authorities, including education	196,200	3·9	5	239,400	3·8	6	+ 22
Hotels, public houses, cinemas, theatres....	181,000	3·6	8	220,000	3·5	9	+ 21·5
Domestic service	1,658 000	33	1	1,258,000	20	1	— 24·1
Total employed females	5,044,000	100	—	6,298,000	100		+ 24·8

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* Home workers and about 61,000 women in the organized corps of women are excluded.

† This number relates to April, 1918; the number for July, 1918, is not yet available.

‡ A few professional workers, nurses, and civil servants, who are not clerks are included in these figures.

The table shows that domestic service still employs the largest number of women and girls, but no longer twice as many as the next largest occupation; domestic servants now form a fifth instead of one-third of the occupied women. Although clerks have been excluded from this paper their extraordinary increase compels a passing mention. Owing to the similarity of the work I have grouped with them the professional workers, who have doubled their numbers, and the workers in the Civil Service other than the Post Office, who have increased twenty-fold. This combined occupation shows an actual increase in numbers (582,300) almost as great as that of the munition trades (647,000); it has become the second largest group of women workers, and has thrust the textile workers into the third place. I have also brought together the women in the metal trades and in Government establishments, since they are practically all engaged upon munition work. As we should expect they have increased by the largest number and now form the fourth largest group. For the rest the table must be left to speak for itself.

In addition to the movement of women into work of a different nature, there has been in the occupations themselves an equally important movement from lower to higher paid, from less to more skilled work; women are now engaged upon many processes previously reserved to men, for which they are paid, if not at men's rates, at all events at rates higher than they received before. This substitution has taken place not only in munition factories but in many non-munition works as well. If it is impossible to make any general statement, either as to its extent or as to its effect on the level of women's wages, it has materially contributed to raising the average wage now paid to women. Nevertheless, until we know what action will be taken to redeem the pledges to the Trade Unions, and what the subsequent policy will be in these trades as well as in the others where no pledges exist, we cannot say how much of the increase due to this cause will be permanent. The present prospect is by no means bright.

Some lasting and substantial improvements have, however, been won during the war. The extraordinary variety in the wages earned by women for the same work has long been the astonishment of observers and the despair of reformers. It was to abolish the individual cases of sweated wages rather than to raise the whole wage level that the establishment of legal minimum rates was urged. Already before the war four trades had been added to the four originally scheduled under the Trade Boards Act of 1909. Although during hostilities no fresh Trade Boards were set up under this Act, many minimum wage scales have been voluntarily adopted, as, for example, in the Potteries, in the Walsall leather trades, in the printing and bookbinding trade of many towns, and for actors. More important still, the Ministry of Munitions adopted the same principle when it issued the famous circular L2 in February, 1916. Although this circular applied at first only to certain firms named in the schedule, the protection of a minimum wage was gradually extended to practically all women munition workers. No sooner had hostilities ended than the first steps were taken to schedule under the now amended Trade Boards Act the following industries :– Brush and broom ; hair, bass and fibre ; flax and hemp : jute ; jute, flax, and hemp finishing ; paper bag making ; aerated waters ; tobacco ; boot and shoe repairing ; shop assistants ; laundries ; corsets ; fur ; and women's clothing. In the women's clothing trade it was decided not to wait for the lengthy process of setting up a statutory trade board and of fixing a trade board rate, but to lay down a legal minimum rate by special order unde the Wages (Temporary Regulation) Act of 1918. Finally, the proposal of a universal minimum rate for all trades made by the Joint Industrial Conference has been accepted by the Government.

In considering the actual sums of money by which wages have been increased since the beginning of the war, it is, of course, unnecessary to remind an audience such as this of the vital distinction between real wages and money wages. The rise in prices is one of the fundamental factors of the situation, however difficult it may be precisely to determine its extent. It must suffice here to quote the official figures for November 1, 1918, which must be borne in mind throughout the following section :—

	Average percentage increase since July, 1914, on November 1, 1918.		
	Large towns.	Small towns and villages.	United Kingdom.
1. Level of retail prices of specified articles of food, assuming same quantities at both dates....	139	128	133
2. Expenditure on same articles of food, allowing for changes in consumption	101	93	97
3. Price of all items ordinarily entering into the working-class family budget (including food, rent, clothing, fuel, light, &c.)	—	—	100–125
4. Price of items in No. 3 allowing for changes in expenditure on food	—	—	100

Minimum Time Rates for Women fixed by Trade Boards of Great Britain.

Trade :	Chain.		Lace finishing.		Paper box.		Tailoring.		Food.		Shirts.		Tin box.		Hollow ware.	
Normal hours in working week on which weekly rate is based :	—		52½.		52.		50.		52.§		50.		52.		54.	
Date.	Hourly.	Weekly.	Hourly.	Weekly.	Hourly.	Weekly.	Hourly.	Weekly.	Hourly.	Weekly.	Hourly.	Weekly.	Hourly.	Weekly.	Hourly.	Weekly.
	d.	*s. d.*	*d.*	*s. d.*	*d.*	*s. d.*	*d.*	*s. d.*	*d.*	*s. d.*	*d.*	*s. d.*	*d.*	*s. d.*	*d.*	*s. d.*
1910, August ..	2½	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1911, August ..	—	—	2¾	12 0½	—	—	—	—	—	—	—	—	—	—	—	—
1912, March ..	—	—	—	—	3	13 0	—	—	—	—	—	—	—	—	—	—
August ..	—	—	—	—	—	—	3¼	13 6½	—	—	—	—	—	—	—	—
1914, January ..	2¾	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1915, June ..	—	—	—	—	—	—	—	—	3	13 0	—	—	—	—	—	—
July.. ..	—	—	—	—	—	—	3½	14 7	—	—	3½	14 7	—	—	—	—
November ..	—	—	—	—	—	—	—	—	—	—	—	—	3¼	14 1	—	—
December ..	—	—	—	—	3¼	14 1	—	—	—	—	—	—	—	—	—	—
1916, January ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3	13 6
August ..	—	—	—	—	—	—	—	—	3¼	14 1	—	—	—	—	—	—
1917, February ..	—	—	—	—	—	—	4	16 8	—	—	4	16 8	—	—	—	—
March ..	—	—	—	—	—	—	—	—	—	—	—	—	3¾	16 3	—	—
May.. ..	—	—	—	—	—	—	—	—	3¾	16 3	—	—	—	—	—	—
July.. ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	3½	15 9
August .	—	—	3½	15 3¾	4	17 4	—	—	—	—	—	—	—	—	—	—
October ..	—	—	—	—	—	—	—	—	4½	19 6	4½†	18 9	4½	19 6	—	—
November .	—	—	—	—	—	—	4½†	18 9	—	—	—	—	—	—	—	—
1918, January .	—	—	—	—	4¾	20 7	—	—	—	—	—	—	—	—	4	18 0‡
March .	4*	—	—	—	—	—	5†	20 10	—	—	5†	20 10	—	—	—	—
June ..	—	—	4	17 6	—	—	—	—	—	—	—	—	—	—	—	—
September .	—	—	—	—	—	—	—	—	5	21 8	—	—	—	—	—	—
November ..	—	—	—	—	—	—	—	—	—	—	6†	25 0	—	—	—	—
December ..	—	—	—	—	5¾	24 11	—	—	—	—	—	—	5½	23 10	—	—
1919, February ..	—	—	4½	19 8¼	—	—	—	—	6½	28 2	—	—	—	—	—	—
March ..	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

* There is now an additional war wage of 30 per cent.
† There was an additional war wage of 1*d.* an hour, which has now been increased to 3*d.*
‡ There is now an additional war wage of 7*s.* 9*d.* per week.
§ The normal working week is now 48 hours.

It is impossible to discuss all the changes in wages since 1914, and a bare summary of the chief facts is contained in the Report of the War Cabinet Committee of Women in Industry. I have already shown the war changes in the trades selected for special discussion; as further examples I give the rising legal minimum rates fixed by the Trade Boards, and the rates ordered by the Minister of Munitions for munition workers. Finally, as a sort of summary of the whole paper, I have placed side by side the wages paid to women at several dates during the last thirty years in those processes for which comparable statements can be found.

The table on the previous page shows the steady rise which has taken place in the legal minimum rates fixed by the Trade Boards.

The table exhibits the extreme caution of these Boards, who did not make any appreciable increase in the rates until 1917, by which time food prices had doubled. At the end of the war, when expenditure on all articles of consumption was twice as high as before, none of the legal minimum rates were yet double their pre-war figure. A rate of 5½*d.* has, however, just been proposed in the lace finishing trade; the 7*d.* rate fixed by the Minister of Labour for the clothing trades is practically double the rates first paid in those trades; and the rate in the food trades was raised in February, 1919, to 6½*d.* compared with 3*d.* in June, 1915. It must be remembered that these are minimum rates, and that much higher wages have been paid in many cases; for instance, in the tailoring trade a minimum of 6*d.* an hour for females in the cutting room was fixed by the Trade Board itself in October, 1916, many trade agreements have been made for higher rates, and, as in normal times, superior skill has always been able to command wages above the lowest level.

The rise in munition workers' wages has followed a similar course. The variety of the work, some of which did not even exist before the war, forbids comparison with pre-war times. The average wage of 12*s.* 8*d.* for full time earnings, and of 12*s.* 2*d.* including earnings for more and less than full time, returned in the 1906 Wage Census, is probably rather above the actual level for all the women then in the trades, and I have not found any evidence of a change between that date and 1914. The following table summarizes the General Orders made by the Minister of Munitions concerning women's wages;—

Wages for work not recognized as women's prior to the war.	Wages for work not recognized as men's prior to the war.
February, 1916.—1*l.* a week for usual working hours.	July, 1916.—Time rate of 4*d.* an hour for piece-workers and premium bonus workers, and of 4½*d.* an hour for time workers. Additional ½*d.* per hour in danger zones.
January, 1917.—Working week not to exceed 48 hours; payment of 6*d.* an hour up to 54 hours. Additional payment for overtime, night-shifts, Sunday and holiday work.	September, 1916.—Additional payment for overtime, night-shifts, Sunday and holiday work. Piece-work earnings to be 33 per cent. above piece-workers' time rates.
April, 1917.—24*s.* for 48 hours or less.	Time rate of 4¾*d.* per hour for piece-workers and premium bonus workers, and of 5½*d.* per hour for time-workers.
August, 1917.—General advance of 2*s.* 6*d.*	
December, 1917—General advance of 3*s.* 6*d.*	
September, 1918.—General advance of 5*s.*	

Thus by the end of the war, the minimum rates for women on men's work had risen to 35*s.*, and for those of women's work to 33*s.* In January, 1919, a further 5*s.* was granted to women in the engineering trade, so that when the hours were reduced to 47 per week, women on men's work received 40*s.* for 47 hours, or 10¼*d.* an hour, and women on women's work, 38*s.*, or 9¾*d.* an hour.

The table contains the barest outline of the 46 orders issued between February, 1916, and September, 1918, regulating the wages and conditions of work of women and girls employed on the munition work under the control of the Ministry. The few details which have been mentioned may give some idea of the many factors which have to be taken into consideration before an estimate of actual earnings can be made. Moreover, at first, the rates which were fixed were considered to be standard, not minimum rates; they were also only gradually made obligatory on all controlled establishments. It was not until the beginning of 1917 that the rates were definitely stated to be merely minima, and not until the end of that year that they became practically universal. We notice here, as in the Trade Board decision, the very slow upward movement at first which only became more rapid under the pressure of high prices.

In the following tables I have summarised a variety of data which are roughly comparable, in order to give a bird's eye view of women's wages for the last thirty years in some typical trades. The figures for 1906 are all taken from the Wage Census of that year, and refer to the United Kingdom unless otherwise stated. The nature of the information obviously makes it impossible to calculate percentage increases, especially as the earlier figures usually represent averages, and the later ones minima.

	1893.	1906.		1914.	1919. (Usually a 48-hour week.
Sewing.					
Dressmaking (bodice hand)—			Hours.		
London	Experienced 18*s*.	Average, 15*s*. 9*d*.	52·8	15*s*. to 22*s*.	April, 1919, minimum, 28*s*.
Provinces	Average, 8*s*. to 12*s*.	,, 11*s*. 7*d*.	53·5	Birmingham, 15*s*. to 18*s*.	,, ,, ,, 28*s*.
Millinery—					
Bespoke, London	Ordinary, 12*s*. to 14*s*.	,, 15*s*. 8*d*.	52·8	Competent, 12*s*. to 18*s*.	January, 1919 ,, 24*s*.
Tailoring—					
Bespoke—					
London	—	,, 16*s*. 2*d*.	56·3	—	April, 1919 ,, 28*s*.
Provinces	—	,, 13*s*. 10*d*	52·4	—	,, ,, ,, 28*s*.
Ready-made—					
London	—	,, 11*s*. 11*d*.	51·7	Minimum, 13*s*. 6½*d*., 50 hours.	,, ,, ,, 28*s*.
Manchester	10*s*. to 12*s*.	U.K. average, 13*s*. 7*d*.	51·2		,, ,, ,, 28*s*.
Underclothing—					
London	—	Average, 15*s*. 10*d*.	48·3	15*s*. to 20*s*.	,, ,, ,, 28*s*.
Provinces	Mean, 10*s*. to 12*s*.	,, 12*s*. 7*d*.	50·2	Northampton, 14*s*.	,, ,, ,, 28*s*.
Corsets	Manchester, 10*s*.	U.K. average, 12*s*. 2*d*.	51·6	—	,, ,, ,, 28*s*.
Upholstery.					
London	1901, 15*s*. to 17*s*.	Average, 14*s*. 10*d*.	54·8	12*s*. to 18*s*	May, 1919, minimum, French polishers, 52*s*., upholsterers, 44*s*.
Provinces	1901, Bristol, 10*s*. to 17*s*.	,, 12*s*. 2*d*.	53·1	—	Manchester, 48*s*.
Laundry					
London	Washers, 2*s*. 6*d*. a day	,, 12*s*. 9*d*.	50·8	—	April, 1919, 24*s*. + 4*s*. war advance.
Provinces	Bristol, washers, 1*s*. 10*d*. to 2*s*. 6*d*.	,, 12*s*.	51·4	—	

		1906.		1914.	1919. (Usually a 48-hour week.)
			Hours.		
Leather.					
Boot and Shoe—					
U.K.	1886, average, 12s. 6d.	Average, 13s. 1d.	53·5	—	March, 1919, minimum, 30s. women 20 years and over for time-workers. Piece-workers at least 25 per cent. above minimum, certain simple processes excepted.
Bristol	1883, ,, 12s. 6d. 1893, average 11s. to 13s.	,, 11s. 7d.	53·1	14s. to 18s.	
Leicester, Machinists	1866, average, 12s. 1867–71 ,, 14s. 1877 ,, 16s. 1880 ,, 15s. 1883 ,, 14s.	,, 15s.	53·1	—	
Harness and Saddlery	Walsall, 9s. to 10s.	U.K., 10s. 7d.	54·4		Walsall minimum, 18s. to 24s. +25 per cent. war bonus.
Fancy Leather Goods	1901, London, 15s. .... —	U.K., 12s. 8d. .... —	54	London, 15s. to 21s. .... Birmingham, 10s. to 15s.	August, 1918, Walsall, minimum scale of 26s. for women of 20 years and over.
Food.					
Cocoa, Chocolate and Sugar Confectionery	1893, Bristol, 12s.	U.K., 11s. 9d.	51·9	—	February, 1919, legal minimum, 26s.
Preserved Food, Jam, Pickles, Sauces	—	U.K., 10s. 11d.	54·1	—	
Confectionery	1893, average, 8s. .... (includes girls)	U.K, 12s. 8d., including baking.	55·9	—	September, 1918, Manchester, 40s. to women 21 years and over; 33s. 4d. bread packers, 30s. tin greasers. Leicester, minimum of 40s. to women 21 years and over.
Mineral Waters	1893, 8s. to 10s., up to 12s.	9s. 7d.	54·1	11s. to 15s.	—
Grain Milling	—	Average, 10s. 1d.	58·1	—	December, 1918, increase of 8s. 6d.

		1906.		1914.	1919. (Usually a 48-hour week.)
			Hours.		
Tobacco.					
London—					
Cigar-making, hand	1900, 20*s.* to 30*s.*	—	—	20*s.* to 30*s.*	May, 1919, minimum wage of 35*s.* proposed for Great Britain.
,, mould	16*s.* to 18*s.*	—	—	15*s.* to 25*s.*	
Stripping	12*s.* to 14*s.*	—	—	12*s* to 14*s.*	
Paper and Printing.					
U.K.	1886, 11*s.* 9*d.*	12*s.* 2*d.*	52·5	—	Minimum scales varying from 22*s.* to 30*s.*
London—					
Printing and Book-binding	—	15*s.* 8*d.*	50·8	Minimum of 16*s.*	September, 1918, time-workers 37*s.*, Piece-workers — 100 per cent. to 120 per cent.
Stationery	—	14*s.*	51·4	—	
Scotland—					
Book-folders	Edinburgh, 1840, 7*s.* ,, 1860, 8*s.* ,, 1880, 10*s.*	12*s.*	50·3	—	November, 1916, minimum wage of 16*s.* + 1*s.* 6*d.* war bonus.
Paper Boxes, plain	1893, Liverpool 10*s.* to 12*s.*	U.K., 11*s.* 10*d.*	53·4	legal minimum, 13*s.*	December, 1918, 24*s.* 11*d.* (52 hours).
	1901, London, 10*s.* to 12*s.*	London, 12*s.*	53·8		
Brushmaking	1901, Bristol, 9*s.*	U.K., 10*s.* 6*d.*	52·7	London, 9*s.* to 12*s.*	August, 1918, War bonus, 8*d.* in 1*s.*
India Rubber and Gutta-Percha	—	U.K., 12*s.* 8*d.*	55	London, 12*s.* to 15*s.*	November, 1918, War advance, 11*s.*
Porcelain, China, Earthenware.					
In Potteries—					
Transferrers	1874, 11*s.* to 12*s.* 1877, 10*s.*	12*s.* 6*d.*	51·5	—	—
Warehouse-women	1855–60, 1*s.* 2*d.* to 1*s.* 4*d.* per day.	10*s.*	51·5	12*s.*	May, 1919, minimum wage of 21*s.* + 5*s.* 4*d.* war bonus.
All women	1833, 7*s.* 3¼*d.* to 9*s.* 1*d.*	12*s.* 3*d.*	51·5	—	May, 1919, War bonus of 62½ per cent.

		1906.		1914.	1919. (Usually a 48-hour week.)
Porcelain, China, Earthenware.			Hours.		
China Clay	—	—	—	—	September, 1918, minimum rate of 20*s.*
Brick and Tile	1886, 9*s.* 4*d.*	11*s.* 5*d.*	55·4	Stourbridge fire-brick makers, minimum of 10*s.*	November, 1918, war wage of 8*s.*
Metal Trades.					
Needles, fish-hooks, fishing tackle	—	12*s.* 10*d.*	50	No change since 1906.	March, 1919, minimum rate fixed. Time workers, 22*s.* 11*d.* (50 hours). Piece workers, at least 25 per cent. more than time workers + 11*s.* war wage,
Lock, latch, and key makers.	—	9*s.* 6*d.*	55	—	March, 1919, 22*s.* and 11*s.* war wage for time workers.
Hollow ware	—	—	—	10*s.* minimum	July, 1919, Legal minimum, 18*s.* + 7*s.* 9*d.* war wages.
Brasswork, lacquering	1840 1850 1860 } Wolverhampton, 7*s.* to 10*s.* 36 hours.	U.K., 12*s.*	52·7	London: cheap work, 10*s.* to 12*s.*; skilled, 18*s.* to 28*s.*	
	1880, Birmingham, 6*s.* to 12*s.*	—	—	Birmingham, 12*s.* 6*d.* to 15*s.*	
Chainmaking	1892, fine, 8*s.* to 12*s.*	Full time, 9*s.* 6*d.* = 2.4*d.* per hour.	46·8	Minimum of $2\frac{3}{4}d.$ an hour.	July, 1918, minimum of 4*d.* an hour + 30 per cent.
	coarse, 7*s.* to 10*s.*	More or less than full time, 7*s.* 6*d.*			
Screws and nails	1880, Birmingham 9*s.* 6*d.*	11*s.* 2*d.*	53	12*s.* to 14*s.*	
Tinplate	1886 10*s.* 4*d.*	14*s.* 9*d.*	47·8	—	
All Metals	—	12*s.* 8*d.*	53·2	15*s.* to 16*s.*	January, 1919, time workers on men's work 40*s.*; on women's work 38*s.* (47 hours).

In no trade is there evidence of a definite decrease of wages; in many of them a distinct rise is noticeable, which is as marked for the few years between 1906 to 1911 as it is for the longer period before the last wage census. If any generalisations are permissible, it would appear as though the rise in women's wages during the middle of the last century, which has been traced for us by Mr. George Wood, had been succeeded by a period when the wages level as a whole remained stationary round the turn of the century. A fresh rise was already beginning before the war, which has since been somewhat accelerated. The war increases are not, however, as great as popular imagination supposes, for wages to-day must be halved before any fair comparison with 1914 earnings can be attempted.

To sum up, the information we have would seem to suggest that, whereas before the war the majority of women earned between 10*s.* and 15*s.* a week, they now earn between 25*s.* and 35*s.* (12*s.* 6*d.* and 17*s.* 6*d.* by pre-war standards). The War Cabinet Committee estimate that "the average of women's earnings over the whole "field of industry proper were towards the end of the war nearer "35*s.* than 30*s.* weekly." [Cmd. 135, p. 150.] As, however, it is extremely doubtful whether women will continue to be employed in the work of skilled men, at which the highest wages were earned, this average is not likely to be maintained; it is probably already a thing of the past. However, many underpaid women have gained the continuous protection of legal or voluntary minimum rates which may soon become universal, while the time worked is being reduced by varying amounts to what will soon be a standard 48-hour week. Moreover, there are good grounds for hoping that as a result of the marked improvement in women's status, organization and skill during the last five years, a permanently higher wage level will gradually be reached.

DISCUSSION ON MRS. BARTON'S PAPER.

PROFESSOR BOWLEY said he had great pleasure in moving a vote of thanks to Mrs. Barton for her very interesting Paper on a very difficult subject. No doubt many of them in the room knew what courage it needed to tackle in detail any question relating to wages and earnings, and how few people had had the courage to make any serious attempt to deal with the question as it affected women. Mrs. Barton had had that courage. She had been, as it were, to spy out the land of those statistics. She gave one the impression that it occurred to her to see what statistics there were and whether she could pick them up; but that was not true, for she knew where the statistics were in quite a wide region, and had taken a part in preparing those statistics, and was well informed on the subject. It was not a land of milk and honey, but a very barren land; but she had brought back a bunch of grapes which quite generally would have taken two men to carry, and certainly it was beyond the power of anyone to digest those grapes in the short period they had at their disposal. Reading through the Paper and listening to it, his feeling was rather akin to despair. There was a great mass of material, more considerable in reality in the last five years than in the previous twenty-five. But as for those connected series which statisticians loved, their absence only made the heart grow fonder and the mind rather more foolish. They could not get a comparison except by some very difficult and, on the whole, some non-statistical method. As he had gone through the Paper, he had tried to form an opinion as to the general level of wages before the war and the general level of wages now. At that time he had not read the final paragraph of the Paper, but he had come to the same conclusion from the evidence that the wages of girls over 18 and of women were about 3*d.* an hour averaged over the great part of industry before the war, and were now nearly 7*d.* After all, 3*d.* might be 2½*d.* or 3½*d.*, a big margin of error, which was very likely the margin one must allow. The value of the Paper, however, was not in its generalization, and he was rather loth to make or accept any generalization, but in its illuminating account of detail. There was a lot of very difficult work in the Paper describing the conditions of wages and employment, and showing how troublesome it was to make any real statement as to average earnings or annual earnings. Anybody who now wished to go into the subject of women's wages would have that valuable account to start from, and very many mistakes would not be made in consequence of it. He thought that might prove to be the most valuable result of the Paper. Having said that, he wished to proceed to one or two points of detail, as, after all, it was a detailed Paper. He would, first of all, be very glad if Mrs. Barton could clear up some of the passages relating to shop assistants, for in the end he did not know whether they got their board and lodging or not in some cases. Another point of quite a different nature was in the earlier part of the Paper, where it was suggested that in the Wage Census in 1906 the wages stated were probably higher than the true average, because firms who paid higher wages more often made returns. He had very often seen that statement, and thought it was not altogether correct. He thought some wages were not included either in the 1896 or 1906 Census; but where a trade was a factory industry and in a town, it was extremely unlikely that the actual wage records of one firm would differ from the wage records of another. If that were the case, how did the firm paying the lower wages get its employees? He thought by the time they got the wage books they got the average of the town, and did not very much modify it by further information from what appeared to be inferior employers. He did not think it should be stated as an accepted fact that in the factory industries to which those Censuses related, the wages were higher than the general average. With regard to the textile industries, there was a difficulty in applying the earnings based on the average of all employed men, women, boys and girls to women's earnings; and he did not think it was quite met by saying women who had replaced men were paid the same rates. They were paid the same piece rate, but in the Wage Census of 1906 the women weavers earned less per week than the men weavers on the average with fewer looms, and he thought it was quite likely in that, as in other industries, that the fact that women were paid the same rate did not result in their making as much as the men. He thought two statements were made rather too dogmatically in that connection; that the real wages of cotton weavers had certainly fallen during the war, and that the opposite was true for the woollen industries. There were two or three points involved, one of which he thought could be made good by a slight modification of or note to the Table. In the column relating to cotton weaving the figures stopped at October, 1918, where they stood at plus 62 per cent. over the average earnings during the first six months of 1914. In December, 1918, however, there was an increase in rates, if he understood it rightly, bringing them to 110 per cent. over the pre-war level, and then the story stopped. He asked what happened with regard to that increase of rates. He had not noticed the omission in time to look at the last number of the *Labour Gazette*; but it was quite easy to put in what did happen from the subsequent *Labour Gazettes*, and they would then have an ending to that story. Another point related to the whole question of the endeavour to measure real wages. He was willing to accept the statistics given for earnings. He thought there was enough detail and description to prevent one using them wrongly if one was careful, and he thought no one knew better than the author of the Paper how extraordinarily easy it would be to use them wrongly. But he was not willing to accept the statement which was made several times in the Paper, that they could obtain real wages by the simple process of halving the money wages. He would not go into the subject, because he had already discussed it at considerable length in that room in April; but he did feel it necessary to suggest there was no simple way of translating real wages in the summer of 1919 into terms comparable with the wages in 1914, whether by dividing by two or three or any other number. It was much more difficult in the case of women's earnings even than in the case of men's earnings, because in the case of a man with a wife and one or more children to support one might assume without enormous risk of misconception and error that the conditions of expenditure were not very diverse for men of full working age; but such an assumption could not be made in the case of women. They had, for example, a statement of women's wages of 19*s.* 4*d.* in cotton weaving before the war. That was quite a nice wage for a girl of 20, but was a very poor wage for a woman with three children to support. When that wage doubled, or more than doubled again, it depended very much what there was to do with it. If the wage of 15*s.* or less a week before the war was the usual wage of a girl of 20, who had not other people to help, which, on the whole, he took it was the normal position, then there was a certain margin—say, 6*s.*—over the barely necessary expenditure. Then, if the wage increased to 30*s.*, the bare necessary expenditure had not increased so much as the 15*s.* increase in wages. If necessaries had doubled in cost, there was now a margin of 12*s.* He was quite well aware when the wage-earners spent it they found things very dear; but he thought this way of putting it made rather a different impression to that made by simply saying that 30*s.* was now worth, in purchasing power, the sum of 15*s.* some years ago. He was not denying the statement, but was only saying, as he had said in April, that the difficulty of making the measurement was extreme, and, on the whole, he thought the Paper would be a little stronger if less emphasis was made on the movement of real wages. The last point he wished to notice was that the activities of the Government Department during the war were directed to accumulating statistics, which they now learned were under official lock and key. He would say that, as regards some of the statistics in Government Departments which he had heard of, that was the best place for them; but he thought, now that there was no fear of giving away valuable information to the enemy by saying what wages were paid to women during the war, perhaps the key might be turned, and Mrs. Barton might be asked to go through the rubbish, picking out what was really important and giving it to the world.

Miss Collet, in seconding the vote of thanks, expressed her deep gratitude to Mrs. Barton for having given her a reference book, which she was afraid would become ragged by use during the next two or three years. By means of the Paper they were able to compare war-time wages, almost right up to the end of the war, with the 1906 position. She wished to touch on the broad results of the comparison of the war-time wages with the 1906 Census as to women generally. One question arose with regard to the minimum which was eventually reached for munition workers. At tne end of 1918 it was a 35*s.* minimum for those engaged on work which was regarded as women's work. Mrs. Barton was not quite clear as to what that ought to be compared with. As women went into munition works from every kind of industry, she thought the right comparison was with the wages of women in all industries, as shown in the 1906 Census. They were then up against a difficulty which she thought had restrained Mrs. Barton from using the 1906 Census as it ought to be used. She had very much avoided anything which looked like pedantry, and to refer to quartiles and medians to the outside world she was afraid would strike her with horror. At the same time, it was the introduction of that information with regard to quartiles and medians which made the value of the 1906 Report, and some English words must be discovered for introducing that information to the general public. They must popularise the practice of concentrating attention on the lowest and highest wages of the middle half of the workers, and if they got the position of the middle half of the workers they need not worry about the quarter above, and they could be sure that the quarter below was rising if the position of the middle half had improved. In the 1906 Wages Inquiry, if they had to fall back on averages, they had 14*s.* 2*d.* as the average for all women working full time; but if they abandoned that and attended to the lowest wages of the middle half, the centre wage, and the highest wages of the middle half, they got a good basis of comparison. The lowest wage of the middle half was 10*s.* 6*d.*, and consequently the increase which was shown in 1918 by the 35*s.* minimum was as much as 214 per cent. On the centre wage, which was 13*s.* 3*d.*, it showed an increase of 157 per cent., and even on the highest wages of the middle half, which was 17*s.* 1*d.*, this minimum showed an increase of 93 per cent. They knew quite well that this minimum was greatly exceeded by the upper half of the workers in the munition works. If they contrasted the progress which was made in the case of the people who were paid out of national loans—which was, of course, the position with regard to the munition workers—and contrasted the changes which had taken place in the wages paid in the ordinary pre-war women's industries, where to a very great extent the wages had to be paid by the consumer, they got a very different state of affairs. Since the war a great deal more interest had been taken in women's wages as compared with men's, and it had been possible in the Department of Labour Statistics to get employers to separate the men and boys from the women and girls in their returns of the amount of wages paid in the last whole week of each month. The returns used by Mrs. Barton were for male and female workers unseparated. Taking all the trades for which these returns are published in the *Labour Gazette*, and selecting the average for the last four months of each year, in 1915 the women and girls' average showed an increase of 17 per cent. on the 1906 average. At the end of 1916 there was an increase of 32 per cent., and in 1917 there was an increase of 61 per cent. on the 1906 average, and in the last four months of 1918 there was an increase of 101 per cent. on the 1906 average for these trades. The rate of increase in their wages was always behind the *Labour Gazette* increase for general retail prices, and not merely behind that of the food prices. Of course, the munition workers were very considerably ahead, and Professor Bowley, she thought, could in that respect fully claim his case; but for the ordinary trades it was not so. The only other branch she wished to refer to was the domestic servants. The Table chosen was a Table which gave the wages for the age group where the largest proportion of servants of that class were found; but she thought perhaps a better way of using the comparison was to take the wages for the one-servant households, the two-servant households, and the three-servant households, etc. The one-servant household they knew. The minimum which was suggested by the Women's Legion was an increase of 75 per cent. on the one-servant households, and as that was the class of household where probably no economy could be exercised with regard to food, she thought they might take it that the cost of domestic service under those conditions would be quite 75 per cent. more in the one-servant household. In the two-servant household, if they took the one which included the general servant and the nurse, the position would be still worse than that of the one-servant household; but if they took the two-servant household which consisted of the cook and the housemaid, then the minimum wages suggested by the Legion showed an increase of 66 per cent. for the housemaid and 47 per cent. for the cook, and a joint increase of 56 per cent. on cook and housemaid. The increases on the larger households were of very little importance. She thought that everybody during the war with more than two servants had had an opportunity of cutting down expenses in the kitchen, and consequently the increase suggested by the Women's Legion was a perfectly easy one to be paid in all the households except the one-servant and the two-servant households. In all probability, instead of 90 per cent. of families not being waited on by domestic servants, about 93 per cent. would have no domestic servants. She thought that suggested that the really important thing for them to consider was not so much the position of the domestic servant. What they had to consider was the position of the home daughter, the home sister, or the home mother, and how to make it as good, at least before the eyes of the law, as that of the general servant and charwoman.

Sir R. HENRY REW said he wished to add his thanks to Mrs. Barton for what he considered to be one of the most valuable papers the Society had had for some time. He confessed, when the subject was announced, some of them might have thought that any subject dealing with women or women's wages was likely to take a somewhat challenging form. Mrs. Barton was to be congratulated on having presented them with a paper which was stimulating, but stimulating from the statistical point of view only. She had laid before them what one might describe as the groundwork for future work. The first thing was to ascertain what existed. The next was to try and see if they could not build something upon that foundation. He wished to say one word upon the point which had been dealt with, much more competently than he could claim to do, by Professor Bowley, and that was to suggest that in these times it was particularly necessary to be careful about making generalisations as to the rise in the cost of living, a subject, of course, which was not only of the utmost importance, but one in which there was the utmost difficulty in arriving at exact figures. Whatever the rise in the prices, not only of food, but of other commodities, might be, the cost of rent, for example, had practically not risen since before the war. Again, with regard to the case mentioned by Miss Collet of the domestic servant, whose wages might be said to have risen by 56 per cent., putting the cook and housemaid together, her cost of living had surely not increased by anything like the extent mentioned by Mrs. Barton. Those were merely remarks by the way on a paper which he would not attempt to discuss, but he rose mainly to call attention to two points in which he took some personal interest. One was the statement which was literally true, that during the war no new Trade Board had been set up. It was, however, clear from other parts of the Paper that a Trade Board for Agriculture was set up during the war, although it was not described exactly by that name. Another point was one which he was afraid the Wages Board itself might be rather responsible for, because, although that body had been criticised, and, no doubt, quite justly, for a great many faults, one of the faults of which it had not been accused was that of idleness, and its activities were perhaps a little difficult to follow. The present wage of the women had been raised generally from 5*d.* to 6*d.* per hour. That was merely for correction, which he was not surprised had not been noted because it was so recent, but when the Paper went on record it would be well that the correction be made, that the 5*d.* and 6*d.* mentioned in the Paper had now been raised to 6*d.* and 7*d.*

Mr. J. E. Allen said that Mrs. Barton stated in her Paper that "War increases are not, however, as great as popular imagination "supposes, for wages to-day must be halved before any fair com-"parison with 1914 earnings can be attempted." It was his view that it was quite impossible during a war like the one they had had, that the general standard of living could be maintained at a pre-war level, and, consequently, no general increase in wages would enable the position of the wage earner to be as good as it was before the war. Any small section might have its standard of living raised during the war; but that must, of course, be at the expense of the rest of the community, and undoubtedly some sections must have their standard lowered. As they knew, all those people who used to be called, rather mistakenly, people with "fixed incomes," now found that their share of the national output had gone down, and the man who had, say, 500*l.* a year before the war and 500*l.* a year now, was about half as well off as he was five years ago. Therefore, if it could be said that the earnings of women as a whole were twice as high in terms of money now as they were five years ago, it must also be said that their economic position had been very largely improved, although it might not mean that they were getting any more food, clothes, or other services than they were getting in 1914.

Mrs. Roland Wilkins said she wished to add her testimony of gratitude as an agriculturist to Mrs. Barton for having got the figures relating to wages of women in agriculture in a handy form, so as to be able to compare them with other trades. As a rule, they looked upon agriculture as a thing apart, and did not compare it with other industries. As regarded the statistics Mrs. Barton had given, she (the speaker) expected Mrs. Barton found the same difficulty which some other people had found when they had been trying to go into the question of the wages of women in agriculture, namely, that the figures given by the different Departments which had issued statistics differed by about 300 or 400 per cent. over the same range of years. The figures of the Census of Production, the Census of Population, the Board of Trade Inquiries, and Board of Agriculture inquiries, differed by at least that amount during the last 50 years. She did not know whether the Royal Statistical Society had any influence with any of those Government Departments; but, if so, she hoped they could suggest some methods by which forms could be sent out, so that the same farmer would fill up the particular person's employment, not according to which Department had sent him the form, but on some fixed system which they would prescribe. Taking an instance of a farmer who employed a domestic farm servant on the farm, which was a very common thing in the mountainous districts of Wales and in the North, if the Census of Production Department sent him a form to fill up he put her down as an agricultural worker, whereas if the Census of Population sent a form he put the same girl down as a domestic servant. As a consequence, when they were trying to get hold of statistics, they were tied up in that way. Mrs. Barton had also said she was really only going to deal in the Paper with the average full-time earnings of women over 18. That was a very difficult thing to do in agriculture, because before the war there were really hardly any of that sort of people unless they were dairy workers. Before the war women really formed a great reserve of potential labour which, during the last half century, or, at any rate, as far as history had touched the subject, showed that as different conditions in agriculture had come about, so that reserve of labour in the wives and daughters of agricultural men had been called upon or had not been called upon to work. For instance, they found that when the large farm took the place of the small farm the women who had worked as smallholders' wives did not necessarily work when the smallholding went out of existence and the large farm took its place. When they did, it was because there was some change in the men's wages, which acted two ways. If the men's wages were very low, the women worked because they wanted to supplement the family budget. If the men's wages were very high, the farmer did not keep quite so many permanent men, but employed more casual woman labour, and therefore the women were more employed in those districts where the wages were high, just as in the districts where the wages were low, but for different reasons. Another reason that affected the employment of women was the scarcity of men in the North owing in the past to their being drawn into the industrial areas. There were all those sorts of factors, often apparently contradictory ones, which in the past had influenced the employment of women, and, in consequence, it was a very difficult subject to get at. They then came to the war, which was an absolutely abnormal time as regarded women in agriculture. The full-time imported worker then more or less came into being, and in the early days of the war she thought the Land Service Corps was the first authorized organization which, with due regard to agricultural conditions, sent out women workers. The wages they received in the early days would give some indication as to current local wages. In 1915 with great trepidation they asked for 12*s.* 6*d.* for their full-time workers for a full week's work. They did not dare ask any more in those days, or farmers would not have consented to give the women a try. Then by 1916 they got 15*s.* without much difficulty, and by 1917 they had the temerity to say they would not send out any women under 18*s.* By that time, owing to the greater scarcity of men, and not, she thought, for any other reason, they found they could get 18*s.* When the Land Army came into existence it was able to start on that minimum wage, and now their women were able to get from 22*s.* to 25*s.* as a minimum. Although Mrs. Barton mentioned in her Paper that the Land Army could get those high wages, that was only their minimum contract. There were many women not in the Land Army who could also get more—from 32*s.* to 35*s.*—because their work, especially on dairy farms, necessitated longer hours and overtime payment. She thought the average wage now was 30*s.* for skilled workers. With regard to the question of board and lodging, she wished to illustrate the sort of anomalies that existed at present. Under the Corn Production Act, if a woman was paid a weekly wage of 25*s.* and was boarded and lodged with the farmer, the latter might only deduct 13*s.*, in most counties, from her wages, and she got 12*s.* in cash; but if, on the other hand, she had to find lodgings outside, and was charged 18*s.* for board and lodging, she received 7*s.* in cash. There was therefore a difference in the same area of 5*s.*, according to whether the farmer was able to board his workers or not, which is one of the curious things that happen when Wages Boards enact.

Mrs. Barton, in reply, said that the Paper had received a much kinder reception than she felt it deserved. It was really only an attempt to collect and present in a useful form material for others to work upon, and if, as had been said, she had succeeded in that attempt, she was satisfied. She had very little to say in reply to the speakers' comments. Exception had been taken to her remarks about the rise in the cost of living. She had no wish to raise this difficult question; yet she could not omit all reference to it, for it was the governing factor of the wage changes since the war, and people needed to be continually reminded of it. She had hoped by using a phrase like "double" to suggest to readers that no absolutely precise increase was meant. She regretted that in discussing shop assistants she had not made it perfectly clear whether or not board and lodging was included in the wages given. That particular point was uncertain in so many of the wage statements she herself had read, that she was most anxious to be absolutely plain herself about it. She ventured to think, in spite of Professor Bowley's remarks, that the real wages of cotton weavers had fallen during the war, because there had been comparatively little substitution of women for men, and there had been a great deal of short time worked and of unemployment, the effect of which did not appear in the figures given. She agreed with Miss Collet's criticism that the average was an unsatisfactory figure to take, and she had received the same comment from Miss B. L. Hutchins. The reason she used it was that in most cases it was the only figure she could get. The figures in the 1906 Wage Census and those collected largely by Miss Collet in the reports of the Lady Assistant Commissioners to the Labour Commission in 1893 were practically the only ones she could find which gave the wages of women in groups. Even in these women and girls were put together in 1893 and kept separate in 1906, so that it was not easy to use them together. If she wanted to make comparisons with figures at other dates, she had to take the average as being the only comparable one. She was not quite clear what was the point made by Mr. Allen. She understood him to think that as everyone's income had gone down in war-time, women ought not to expect their wages to be as high or even higher than they were before. Nobody had disputed her estimate that the bulk of the women were earning between 10*s.* and 15*s.* before the war, when 17*s.* had been found by careful calculation to be the least sum a woman needed to maintain herself decently. She thought, therefore, that women ought to be able to earn at least the same and even higher real wages than before, in order that they might be healthy and efficient workers and citizens.

A vote of thanks was passed to the Author.

The following Candidates were elected Fellows of the Society:—

Henry W. Apperly.
Aleš Brož (representing the Czecho-Slovak Legation).
Andrew M. Campbell (representing Messrs. T. F. Firth & Sons, Ltd.).
William Palin Elderton (representing the Institute of Actuaries).
Frederick J. B. Gardner, M.C.
John A. McGilvray.
Leopold Springer.
Lewis J. B. Turner.

REPORT OF THE COUNCIL

For the FINANCIAL YEAR *ended December* 31, 1918, *and for the* SESSIONAL YEAR *ending June* 17 1919, *presented at the* EIGHTY-FIFTH ANNUAL GENERAL MEETING *of the* ROYAL STATISTICAL SOCIETY, *held at the Society's Rooms*, 9, *Adelphi Terrace, Strand, London, W.C.* 2, *on June* 17, 1919.

THE Council have the honour to submit their Eighty fifth Annual Report.

The roll of Fellows on December 31 last, as compared with the average of the previous ten years, was as follows :—

Particulars.	1918.	Average of the previous Ten Years.
Number of Fellows on December 31	761	820
Life Fellows included in the above	167	169
Number lost by death, withdrawal, or default	43	53
New Fellows elected	47	43

Since January 1 last, 36 new Fellows have been elected or restored to the list, and the Society has lost 24 by death, resignation, or default, so that the number on the list, excluding Honorary Fellows, on June 17, 1919, is 773, an increase of 16 over the number recorded on June 18 last year.

Since June, 1918, the Society has lost by death the undermentioned Fellows :—

		Date of Election.
	Boyd-Carpenter, the Right Rev. Bishop, K.C.V.O.	1903
d	Cooke-Taylor, R. Whately	1887
	Crewdson, Ernest	1878
c d	Cunningham, Ven. Archdeacon, D.D.	1883
d p	Hazell, Walter, J.P.	1913
	Heath, John St. George C.	1909
	Hillingdon, the Right Hon. Lord	1900
	Howell, Francis Buller	1883
	*Nicholson, Sir Charles N., Bart., M.P.	1895
c d p	*Palgrave, Sir R. H. Inglis, F.R.S.	1866

* Life Fellow.
c Member of the Council.
d Donor to the Library.
p Have contributed Papers to the Society.

		Date of Election.
	Planck, Surgeon-General Charles	1881
	Trachtenberg, Mendel I., B.A.	1911

Honorary Fellow.

d	Monsieur A. N. Kiær, Christiania	1874

d Donor to the Library.

Although the list of deaths is, happily, the shortest recorded for some years, the Society has suffered a heavy loss by the passing away of such eminent Fellows as Lord Rhondda, in 1918, Sir R. H. Inglis Palgrave, in January last, and the Venerable Archdeacon Cunningham on June 10th. Sir Inglis Palgrave had been a Fellow since 1866, Archdeacon Cunningham since 1883, while Lord Rhondda was elected in 1888. The death of Mr. R. W. Cooke-Taylor is also recorded with especial regret. Obituary notices of these Fellows appeared in the *Journals* for July, 1918, and March, 1919. One death occurred on active service, namely, that of Mr. M. I. Trachtenberg (Lance-Corporal, Royal Fusiliers), who succumbed to malaria in Palestine last October.

Since June, 1918, the following new Fellows have been elected:—

Aiyengar, R. R., B.A.
Allen, J. E.
Apperley, H. W.
Ashley, Anne.
Bailey, Daniel.
Bartley, Richard T.
Bhattacharjya, D., B.A.
Brož, Aleš (representing the Czecho-Slovak Legation).
Cadman, Alfred E., B.A.
Campbell, A. M. (representing T. F. Firth & Sons, Ltd.).
Charlton, Frank.
Crathorne, Arthur R.
Dent, Sir Francis.
Elderton, W. Palin (representing the Institute of Actuaries).
Etlinger, Dorothy P.
Farmer, Ernest C.
Farrer, Hon. Cecil C.
Firth, Alec G.
Franklin, Ernest L.
Frobisher, Arnold.
Gardner, F. J. B.
Gibbon, I. G., C.B.E.
Gibson, Thomas G.
Goaman, J. F. (representing the Chamber of Horticulture).
Gray, H. A. Bennie.
Green, Ernest R. G.
Greenwell, Allan.
Gregory, T. E. G.
Hoare, Alfred.
Holden, Sir Edward H., Bart.
Holt, Richard D.
Jackson, Herbert Moore.
Lanchester, Frederick W.
McGilvray, J. A.
Macmillan, Douglas.
Mitchell, Vyvyan J.
Mitra, Amritalal, B.A.
Murray, John, M.P.
Napier, E. S. (representing the Zionist Organisation).
Pardo, Guido, L.L.F.
Pavlovsky, George A.
Perry-Lewis, Captain George.
Pownall, Lt.-Col. Assheton, M.P.
Rashad, Ibrahim.
Reed, Charles.
Roberts, Bertrand.
Schuster, Sir Felix, Bart.
Sećerov, Slavko, D.Ph.
Shang, Shoa S., M.A.
Spear, B. E.
Springer, Leopold.
Stone, Joseph E.
Turner, L. J. B.
Tutill, Hubert L., A.S.A.
Ward, J. S. M. (representing the Federation of British Industries).
Wenn, Albert E.
White, Benjamin.

The Society has, for the first time since 1911, shown an actual increase in its numbers; and it is hoped that this growth may be promoted by the recent resolution of the Council permitting corporate bodies to join through a representative. By the proposed amendment of Bye-law No. 4 the condition of personal knowledge on the part of the sponsors will be dispensed with in the nomination of such a representative, provided that the association he represents has been accepted by the Council. In view of the increasing number of requests for use of the Library received from Government Departments and Commissions, trading companies, and other bodies, it is believed that the new rule will add considerably both to the usefulness and the membership of the Society.

The Society itself has been, since March, included on the Conjoint Board of Scientific Societies, which was founded in 1916, at the instance of the Council of the Royal Society, to co-ordinate the various scientific activities and promote the scientific interests of the nation.

Turning to finance, the thanks of the Council have been tendered to the Auditors for their honorary services, and their balance-sheet shows that the receipts for the year 1918 amounted to 2,487*l.*, excluding the income-tax repayment of 182*l.*, and exceeded the expenditure sufficiently to permit the investment of 500*l.* in National War Bonds. Subscriptions and compositions amounted to 1,353*l.*, against 1,238*l.* in 1917. *Journal* sales brought in 304*l.*, against 311*l.*, while the rise in the total expenditure from 1,632*l.* to 1,900*l.*, was mainly due to the additional cost of producing the *Journal*, the expense of which advanced from 403*l.* to 664*l.* The major part of the increase is owing to the rise in printers' wages, and is not likely to be much reduced; so that it has been considered necessary to raise the price of the *Journal* to 7*s.* 6*d.* Salaries and wages show a slight increase on 1917, and this expenditure will be higher in the present year, since the office staff has now been restored to its pre-war number, and the rate of wages has risen.

Changes have taken place in the staff. Captain Kohan, Assistant Secretary of the Society since 1909, having resigned this office, the Council unanimously passed the following resolution:—

> "That the Council of the Royal Statistical Society have received with much regret the resignation by Captain C. M. Kohan of the Assistant Secretaryship of the Society, which

he had held since October, 1909. The Council desire to express their appreciation of the ability with which he fulfilled his duties, and their best wishes for his success in his future career."

The resignation of the Assistant Secretary necessitated the reorganisation of the office, and the Council decided to divide the duties between Mr. J. A. P. Mackenzie, Librarian, and Miss Thorburn, Chief Clerk, with suitable clerical assistance. The Council desire to record their appreciation of the manner in which Mr. Mackenzie carried on, in addition to his work as Librarian, the secretarial duties of the office almost single-handed for a considerable time during the war.

The Ordinary Meetings have been held monthly from November, 1918, to June, 1919.

The Papers read before the Society during the Session were as follows:—

1918.	
I.—November 19	Darwin, Major Leonard, Sc.D. Eugenics in relation to Economics and Statistics.
II.—December 17	Brownlee, John, M.D., D.Sc. On the Biology of a Life Table.
1919.	
III.—January 21	Samuel, Right Hon. Herbert. The Taxation of the Various Classes of the People. (Presidential Address.)
IV.—February 18	Greenwood, Major, M.R.C.S. Some Problems of Industrial Organisation.
V.—March 18	Dioueritch, Dr. George. A Survey of the Development of the Serbian (Southern Slav) Race.
VI.—April 15	Bowley, A. L., Sc.D. On the Measurement of Changes in the Cost of Living.
VII.—May 20	Stamp, J. C., C.B.E., D.Sc. The Wealth and Income of the Chief Powers.
VIII.—June 17	Barton, Mrs. Walter. The Course of Women's Wages.

The Library has continued to be of considerable service to various Government Departments, and its usefulness in this respect did not diminish with the cessation of hostilities; its resources have, in fact, been much in demand in connection with the problems of the after-war period. The War Trade Statistical Department, to which the Library was able to afford some assistance during the war, has offered, in return, to present the Society with certain of the Department's publications, which will form a valuable record of the methods employed and the results achieved in an important branch of our war activities.

The number of additions to the Library and the statistics of its use by Fellows and others will be found in Appendix C. The monthly average of volumes lent during the year ending May 31. 1919, was 59, and that of borrowers 34. The number of persons using the Library during this time averaged 82 a month.

In November the Council authorised the reduction of the *Journal* stock of the years 1838 to 1909. The bulk of the redundant parts were advantageously sold as waste, thereby releasing some much-needed space; while a certain number were kept and offered, temporarily, to Fellows at a reduced price. This offer is meeting with a satisfactory response.

The binding of books, which had fallen into arrear during the war on account of the duty of economising both money and labour, is now being resumed.

The Council have approved the project of issuing a new catalogue of the Library, and it is hoped that the Library Committee will be able to put the work in train early next Session.

No award of the Howard Medal was made during the year 1917-18, and it has been decided that it shall not be offered for competition in the Session 1918-19. Under the regulations for the award of the Guy Medal the Council have awarded a medal in silver to Dr. J. C. Stamp, C.B.E., for the two papers recently contributed by him to the Society.

The Council have received with great regret the resignation on grounds of health by Mr. G. Udny Yule, of the office of Honorary Secretary, held by him since 1907. They desire to record their hearty appreciation of the valuable services rendered to the Society by Mr. Yule, and are glad to think that he will still be associated with the policy of the Society as a member of Council. They confidently hope that future issues of the *Journal* will contain many contributions to the theory of statistics from his pen.

The following Fellows (nominated in accordance with Bye-law 14) are recommended for election as President, Council, and Officers of the Society for the Session 1919-20 :—

PRESIDENT.

The Right Hon. Herbert Samuel

COUNCIL.

W. M. Acworth, M.A.
Edward Bond, M.A.
*Arthur L. Bowley, Sc.D.
The Earl Brassey.
John Brownlee, M.D., D.Sc.
Sydney J. Chapman, C.B.E., M.A.
*Miss Clara E. Collet, M.A.
*Major Leonard Darwin, R.E., D.Sc.
*Reginald Dudfield, M.A., M.B.
Alfred W. Flux, M.A.
D. Drummond Fraser.
*Major Greenwood, M.R.C.S.
*Sir R. A. Hadfield, Bart., F.R.S.
Edgar J. Harper.
Robert Holland-Martin, C.B.
The Right Hon. F. Huth Jackson.
John M. Keynes, C.B., M.A.
A. W. Waterlow King, J.P.
H. W. Macrosty, O.B.E., B.A.
Edward R. P. Moon.
Herbert V. Reade, C.B.
Sir R. Henry Rew, K.C.B.
B. Seebohm Rowntree.
Charles P. Sanger, M.A.
E. C. Snow, M.A., D.Sc.
J. Calvert Spensley.
J. C. Stamp, C.B.E., D.Sc.
T. H. C. Stevenson, C.B.E., M.D.
Mrs. Frances Wood.
G. Udny Yule, C.B.E., M.A.

Those marked * are proposed as new Members of Council.

TREASURER.

Robert Holland-Martin, C.B.

HONORARY SECRETARIES.

A. W. Flux, M.A. T. H. C. Stevenson, C.B.E., M.D.
Major Greenwood, M.R.C.S.

HONORARY FOREIGN SECRETARY.

Sir R. Henry Rew, K.C.B.

The abstract of the Treasurer's account of receipts and payments and the estimate of assets and liabilities on December 31, 1918, together with the report of the Auditors on the accounts for the year 1918, are appended.

Signed on behalf of the Council,

HERBERT SAMUEL
President.

G. UDNY YULE,
A. W. FLUX,
T. H. C. STEVENSON, } *Hon. Secretaries.*

APPENDICES TO ANNUAL REPORT.

A (i).—Abstract *of* Receipts *and* Payments *for the* Year *ended* December 31, 1918.

RECEIPTS.

	£	s.	d.	£	s.	d.
alance at Bank on deposit	300	0	0			
alance at Bank, December 31, 1917	215	19	3			
alance of Petty Cash	4	8	10			
alance of Postage Account...	0	13	4			
				551	1	5
ividends on 2,236*l.* 11*s.* 3*d.* Consols, Account A ...	40	10	8			
ividends on 10,257*l.* 12*s.* 3*d.*, Consols, Account B	190	16	4			
ividend on 1,000*l.* G.N.R. Pref. Conv. Ord. Stock	29	10	0			
ividends on 100*l.* War Loan Bonds	4	5	0			
nterest on money on deposit	9	3	7			
				274	5	7
nnual Subscriptions:—						
41 Arrears	86	2	0			
484 for 1918............	1,016	8	0			
14 in Advance	29	8	0			
				1,131	18	0
ompositions				222	0	0
Journal" Sales				304	16	0
dvertisements in "Journal"				3	7	6
				2,487	8	6
epayment of income tax...........				182	3	10
Total				£2,669	12	4

PAYMENTS.

				£	s.	d.
Rent and Taxes:—						
Rent, less Tax......	£285	0	0			
Taxes for 1917-18...	113	4	2			
Total	398	4	2			
Less Sub-let...	—	—	—			
				398	4	2
Fire, Lights and Water	53	18	6			
Furniture and Repairs	16	8	0			
Salaries, Wages and Pension	533	13	11			
				604	0	5
"Journal," Printing and Paper	616	8	3			
,, Shorthand Reporting	31	5	4			
,, Literary Services	17	4	0			
				664	17	7
Ordinary Meeting Expenses	23	0	10			
Advertising	26	7	4			
Postage	29	0	3			
				78	8	5
Stationery and Sundry Printing	69	11	11			
Library	32	13	7			
Miscellaneous	50	10	4			
Medals	1	17	6			
				154	13	4
				1,900	3	11
Balance at Bank on deposit	300	0	0			
Balance at Bank on current account...	463	17	6			
Balance of Petty Cash	4	7	10			
,, Postage Account	1	3	1			
				769	8	5
Total				£2,669	12	4

(Signed) "S. Chapman,
"J. Calvert Spensley, } *Auditors.*
"A. D. Webb,

"*February* 7, 1919."

A (ii).—ESTIMATE *of* ASSETS *and* LIABILITIES *on* DECEMBER 31, 1918.

LIABILITIES.	£ s. d.	£ s. d.	ASSETS.	£ s. d.	£ s. d.
Miscellaneous Accounts, as per list...	164 13 7		Cash Balances	769 8 5	769 8 5
4 Subscriptions received in advance...	29 8 0	194 1 7	2,236*l.* 11*s.* 3*d.* Consols (General Fund). (Price, December 31, 1918, 59⅛*l.*) say	1,322 0 0	
			10,527*l.* 12*s.* 3*d.* Consols (Guy Bequest). (Price, December 31, 1918, 59⅛*l.*) say	6,225 0 0	
Balance in favour of the Society (Exclusive of (1) Books in Library; (2) Journals, &c., in Stock; and (3) Pictures, Furniture and Fixtures)		8,944 16 10	100*l.* 5 per cent. National War Bonds	100 0 0	
			1,000*l.* G.N.R. Preferred Converted Ordinary Stock. (Price, December 31, 1918, 63½*l.*) ...	635 0 0	8,282 0 0
			Arrears of Subscriptions recoverable, say 25	52 10 0	
			Sundry debtors (R. Econ. Society) ...	35 0 0	87 10 0
		£9,138 18 5			£9,138 18 5

A (iii).—BUILDING FUND (ESTABLISHED *July* 10, 1873): STATEMENT *of the* FUND *on* DECEMBER 31, 1918.

This Fund is invested in Metropolitan Consolidated 3*l.* 10*s.* per Cent. Stock, and on December 31, 1917, the Fund was represented by 639*l.* 15*s.* 2*d.* of the above Stock. With the dividends received during 1918, additional Stock to the value of 19*l.* 2*s.* 11*d.* was purchased by the Bank of England for the Society. Accordingly, on December 31, 1918, the total investment amounted to 658*l.* 18*s.* 1*d.* Stock.

(Signed) "S. CHAPMAN,
"J. CALVERT SPENSLEY, } *Auditors.*
"A. D. WEBB,

"*February* 7, 1919."

(iv).—"REPORT OF THE AUDITORS FOR 1918.

"*The Auditors appointed to examine the Treasurer's Accounts for the Year* 1918,

"REPORT:—

"*That they have compared the Entries in the Books with the Vouchers for the same, from January* 1 *to December* 31, 1918, *and find them correct, showing the* RECEIPTS, *including a Balance of* 551*l.* 1*s.* 5*d. from* 1917, *to have been* 2,669*l.* 12*s.* 4*d.*, *and the* PAYMENTS 1,900*l.* 3*s.* 11*d.*, *leaving a balance in favour of the Society of* 769*l.* 8*s.* 5*d. on December* 31, 1918.

"*They have also had laid before them an Estimate of the Assets and Liabilities of the Society at the same date, the* FORMER *amounting to* 9,138*l.* 18*s.* 5*d. and the* LATTER *to* 194*l.* 1*s.* 7*d.*, *leaving an excess of Assets over Liabilities of* 8,944*l.* 16*s.* 10*d.*, EXCLUSIVE *of* (1) *Books in Library;* (2) *Journals in Stock;* and (3) *Pictures, Furniture, and Fixtures.*

"*They have* VERIFIED *the investments of the Society's General Funds.* 2,236*l.* 11*s.* 3*d Consols*, 100*l. National War Bonds and* 1,000*l. G.N.R. Stock; the Guy Bequest* (10,527*l.* 12*s.* 3*d. Consols*); *the Building Fund* (658*l.* 18*s.* 1*d. Metropolitan Consolidated* 3*l.* 10*s. per cent. Stock*), *and also the Bankers' balance* (763*l.* 17*s.* 6*d.*): *all of which were examined and found correct. The market prices at December* 31, 1918, *have been adopted in valuing the Society's investments.*

"*They further find that at the end of the year* 1917 *the number of* FELLOWS *on the list was* 757, *which number was reduced in the course of the year to the extent of* 43, *by Deaths, Resignations and Default; and that* 47 *new Fellows were elected or restored to the list, leaving on the list on December* 31, 1918, 761 *Fellows of the Society, of whom* 167 *were compounders.*

(Signed) "S. CHAPMAN,
"J. CALVERT SPENSLEY, *Auditors.*
"A. D. WEBB,

"*February* 7, 1919."

B.—*Statement of the Condition of the Society in the last Twenty-five Years 1894-1918.*

Year.	Number of Fellows on December 31.	Number of Life Fellows included therein.	Losses during Year by Deaths, &c.	Gains by Election, &c., during Year.	Income from					Expenditure.			Amount Invested on December 31.	Year.
					Annual Subscriptions.	Compositions.	Journal Sales.	Investments and other Sources.	All Sources.	Total.	Of which On Journal.	Of which On Library.		
					£	£	£	£	£	£	£	£	£	
1894....	933	180	67	36	1,491	105	152	82	1,830	1,904	649	75	2,900	1894
'95....	928	180	59	54	1,468	63	180	82	1,793	1,823[j]	576	56	2,900	'95
'96....	910	181	48	30	1,478	42	168	84	1,772	1,787	571	44	2,900	'96
'97....	892	182	58	40	1,472	145	157	83	1,857	1,986[k]	650	50	2,900	'97
'98...	878	180	57	43	1,451	115	182	105	1,853	1,825	609	55	3,300[l]	'98
'99....	896	181	44	62	1,432	95	167	127	1,821	1,805	564	33	3,300	'99
1900....	923	179	36	63	1,514	21	189	148	1,872	1,817	521	53	3,300	1900
'01....	926	177	49	52	1,464	63	211	129	1,867	1,823	518	42	3,300	'01
'02	932	177	52	58	1,504	21	255	152	1,932	1,839	543	73	3,300	'02
'03 ..	939	174	49	56	1,517	84	293	151	2,045	1,875	593	91	3,300	'03
'04....	925	175	58	44	1,407	124	253	152	1,936	1,931[a]	521	92	3,400	'04
'05...	911	178	59	45	1,465	168	220	220	2,073	2,074[m]	665	67	11,975[n]	'05
'06....	891	177	63	43	1,464	82	225	408	2,274[o]	1,988	645	95	11,449	'06
'07....	861	172	63	33	1,363	82	327[q]	408	2,180	2,401[p]	571	87	11,746	'07
'08....	855	170	46	40	1,339	84	254	494[r]	2,171[r]	2,428[s]	602	92	11,920	'08
'09....	825	167	82	52	1,307	84	273	396	2,060	2,369	641	99	12,084	'09
1910....	845	172	37	57	1,304	141	326	974[t]	2,746[t]	2,726[u]	803	74	11,210	1910
'11...	867	174	40	62	1,415	126	308	405	2,255	2,372[v]	721	104	10.875	'11
'12 ...	854	175	57	44	1,336	105	334	382	2,157	2,174	776	81	10.599	'12
'13....	846	174	61	53	1,331	84	294	399	2,108	2,058	671	79	10,092	'13
'14....	821	169	64	39	1,281	42	271	489[y]	2,083	2,319[x]	813	88	9,528	'14
'15...	772	163	61	12	1,243	63	268	351	1,925	1,803	448	40	8,182	'15
'16...	758	163	48	34	1,181	42	325	302	1,850	1,655	507	36	7,702	'16
'17....	757	161	41	40	1,186	52	311	305	1,854	1,732[z]	403	54	7,656	'17
'18....	761	167	43	47	1,132	222	305	459	2,118	1,900	665	32	8,282	'18

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[a] Includes purchase of Government stock

[j] Includes cost of Subject-Index to *Journal*.

[k] Includes cost of doing up interior of premises.

[l] Includes 400*l*. G.N.R. Stock, purchased with Mr. J. Heywood's Legacy of 500*l*.

[m] Includes 100*l*. to International Statistical Congress Fund.

[n] Includes the Guy Bequest. The total invested is now valued at current prices.

[o] Including 126*l*. for sale of books.

[p] Includes purchase of 600*l*. G.N.R. Stock.

[q] Includes special sales.

[r] Includes Sanford Bequest, 100*l*.

[s] Includes 160*l*. for Catalogue and 288*l*. for purchase of Stock.

[t] Includes 500*l*. from sale of Consols and 68*l*. Income-Tax refunded.

[u] Includes 436*l*. for re-decoration of premises, installing electric light and furniture.

[v] Includes 169*l*. for furniture and carpets and "at home" expenses.

[x] Includes 100*l*. to International Statistical Institute.

[y] Includes 100*l*. raised by sale of 134*l*. 14*s*. 9*d*. Consols for the purpose of note x.

[z] Includes purchase of 100*l*. 5 per cent. National War Bonds.

C.—*Estimated Numbers of Books Added to the Library and Lent, and Numbers of Borrowers from the Library in the Sessional Years* 1916-17, 1917-18, *and* 1918-19.

Months.	Works Received.*			Books Lent.						Borrowers.			Fellows and Visitors using the Library.			Months.
				1916-17.		1917-18.		1918-19.								
	1916-17.	1917-18.	1918-19.	Works.	Vols.	Works.	Vols.	Works.	Vols.	1916-17.	1917-18.	1918-19.	1916-17.	1917-18.	1918-19.	
1918.																1918.
June	—	—	—	117	156	59	67	59	74	50	31	33	151	152	83	June
July .... }	569	567	534	68	106	73	117	52	63	44	41	34	127	114	79	July
August .... }	—	—	—	75	200	79	115	37	44	29	41	30	68	98	27	August
September............ }	—	—	—	58	140	14	22	27	47	34	8	20	66	16	30	September
October................ }	—	—	—	70	109	71	107	67	95	35	44	30	94	113	75	October
November............ }	—	—	—	76	141	96	126	40	57	49	46	29	80	148	91	November
December .... }	—	—	—	82	138	114	121	58	67	51	51	34	95	124	95	December
1919.																1919.
January	209	200	196	95	198	77	134	58	73	40	44	39	122	122	92	January
February	—	—	—	49	84	65	81	72	88	34	33	41	105	111	63	February
March	67	65	98	71	89	69	81	74	103	47	44	45	103	108	118	March
April........................	—	—	—	117	186	66	84	66	78	48	44	42	104	109	111	April
May	73	84	81	85	110	68	85	102	138	53	41	70	120	97	128	May
Sessional year	918	916	909	846	1,501	857	1140	712	927	464	468	447	1,084	1312	992	Sessional year
Monthly average	76	76	75	75	136	71	95	59	77	42	39	34	98	109	82	Monthly average

* These figures represent the number of works entered during the year, under "Additions to the Library," in the *Journal*, and not the number of separate volumes; they are exclusive of about 200 weekly, monthly, and quarterly periodicals regularly received.

PROCEEDINGS AT THE EIGHTY-FIFTH ANNUAL GENERAL MEETING OF THE ROYAL STATISTICAL SOCIETY HELD ON TUESDAY, JUNE 17, 1919.

Sir BERNARD MALLET, K.C.B., ex-President, in the Chair.

The CHAIRMAN: Ladies and gentlemen, I do not think I need read the circular convening the meeting, which you have had, nor the draft report, nor would there be time to go through it in any detail. I must just allude to one or two points before moving its adoption. One is that there is the usual list of recorded deaths. It is very short, but unfortunately we have lost a certain number of distinguished men. An important point is that for the first time since 1911 there has been an actual increase in our membership. I think this is due largely to individual efforts of the President and other Members in interesting their friends in the Society. I think it is also due to the high level at which the Papers have been kept during these last two or three years. The Council hopes that by the plan which has been introduced lately of permitting corporate bodies to join through a representative, we may also increase our influence and membership rather considerably. I notice that of the eight gentlemen elected to-day, for instance, four of them come in under the new scheme as representing corporate bodies, libraries, societies, banks, insurance offices, trading companies and other associations. I shall have to move an alteration in a bye-law later on to authorise this arrangement, and also we shall have to ballot for the new Council. Meanwhile I think I need only say I am sure the Society will be very glad that the President, who has taken the liveliest interest in the Society, has agreed to serve for another year. (Hear, hear.) I beg to move: That the Report of the Council, the Abstract of Receipts and Payments, the Estimates of Assets and Liabilities, and the Report of the Auditors for 1918, be adopted, entered on the Minutes and printed in the Journal.

Sir ATHELSTANE BAINES: I have very great pleasure in seconding that. I shall not make much addition to the remarks which have already been made by our Chairman. It is extremely gratifying that in all the untoward circumstances of the year, we have been able to keep up the number of our Fellows. It is all the more astonishing to me, because the decline has been so steady and so continuous for the last fourteen or fifteen years. The fact is that the status of the Society has rather changed. There is a competition of specialisation nowadays which we cannot expect to stand against, but which we can only stay by the efforts of the individual and by making our library more necessary to the requirements of those engaged in special studies. The old status of the Society, when there was a need for a Statistical Society, has been very much lowered by these specialist societies; and what we can do is to get into touch with the modern branch, and as we have begun I hope we may continue. As regards the seconding of the Report, I have merely as a matter of formality to call attention to the fact that, of course, the Report has to be printed in anticipation of this meeting; and while it refers, as a report ought to, to past history, there are on one or two pages references to matters which are to be passed at this meeting. It is only conventional. We do include it in the Report, but on page 556 there is the question of a bye-law which we shall ask you at this meeting to pass, and we have also included the Officers and Council for the year, who have not yet formally received the sanction of the Members of the Society. If they are taken as printed in the Report in anticipation of sanction, I beg to second the adoption of the Report.

The adoption of the Report was put to the meeting and carried unanimously.

The CHAIRMAN: I now have to move the amendment of Bye-law No. 1 by an addition to read as follows:—

> "The representatives nominated by Corporations may be proposed and seconded by the honorary officers of the Society without personal knowledge, and this procedure may also be followed subject to the approval of the Council in the case of apparently suitable candidates who have failed to procure proposers and seconders qualified by personal knowledge."

I do not know whether anybody has anything to say about this proposal. We sometimes find difficulty with regard to the ordinary nominations. Some candidate comes up who does not actually know a Fellow; and it has been convenient for some Member of the Council who knows something of him, to do it in that way. But here it is absolutely necessary in the case of representatives of Corporations sent up to us. The Council were obliged to act in anticipation.

Sir ATHELSTANE BAINES: With regard to individual Members, the Council will use it very carefully.

The CHAIRMAN: The Council had to act in anticipation of the consent of the Annual Meeting, because we were anxious to act on this proposal of the Committee as soon as we could, and admit some of these representatives. We relied on the Annual General Meeting approving. I think I need not say anything more about it. I will put it now to the meeting.

The Amendment was carried unanimously.

The Chairman announced that the result of the ballot was that the new Council was unanimously elected.

The Chairman also moved a vote of thanks to the two scrutineers, which was carried unanimously.

The list of defaulters was read by the Secretary. The Chairman declared their names to be removed.

Dr. ISSERLIS: I have very great pleasure in asking the Society to give a cordial vote of thanks to the President, the Council and Officers of the Society for their services during the past year. I do not think I need say anything more.

Mr. J. E. ALLEN: I have much pleasure in seconding that resolution. I regret, of course, the absence of our President, but I think we must all feel proud, first of all that he has this new appointment, and secondly of the excellent work which he did as Chairman of the Committee on National Expenditure.

The vote of thanks was carried unanimously.

The CHAIRMAN: I express the thanks of the Council to you. I should just like to mention we all very much regret the loss of Mr. Yule, one of the Honorary Secretaries, who has resigned owing to a partial loss of his eyesight.

Lord BLEDISLOE: I should like, if I may, to associate myself with this expression of the sense of the loss of Mr. Yule, because I have been associated with him now for the last two years and a half in connection with the Ministry of Food, and I am afraid it is the very arduous work he did in that department which has necessitated his ceasing to act as a valued official of this Society. As you are making an appeal for further Members, may I also suggest whether it is not desirable to give full notice to your Members of such advantages as the Society offers. I had the extreme honour more than eighteen months ago of being elected a Member of your Society. The notice I received yesterday is the first intimation I have received of any of your proceedings, and I am sorry to say I was asked to come here at half-past six. I have evidently missed what has been obviously an exceedingly interesting Paper, the discussion of which I should have liked to hear. I only mention this now, because I feel that Fellows who have the honour of being elected should have the privilege of hearing your discussions.

The CHAIRMAN expressed his regret, and explained that it had never been the custom to send individual notices of meetings to all the Fellows, many of whom lived away from London, and even abroad, but that the dates of meetings were always notified on the card sent round at the opening of the session, each meeting was advertised in the Press, and that separate notices were sent to any Fellow who expressed the wish to have them. Care would be taken that in future Lord Bledisloe should receive these notices.

The meeting then terminated.

REVIEWS OF STATISTICAL AND ECONOMIC BOOKS.

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1.—*The Taxation of Capital.* By Sir Alfred W. Soward, C.B., and W. E. Willan. xvi + 408 pp. 8vo. London: Waterlow and Sons, Ltd., 1919. Price 18*s.* 6*d.*

To that patient industry which any competent student may bring to bear upon a subject, there is added in this work that intimate natural handling which is born only of lifelong practical acquaintance. The long association of both the authors with the Estate Duty administration makes this book authoritative in a sense which can never attach to careful research alone. They remark that the bibliography of the death duties is almost exclusively confined to their legal aspect, and "information concerning "them from their historic, economic, statistical, or international "point of view has had to be sought in isolated chapters in the "treatises of our leading economic authors, or in the works of "foreign writers." From these quarters an ample harvest has been reaped, and the authors' hope of filling this gap in the bibliography of fiscal science has been fully justified. We have a compendium of historical and statistical information and a collection of opinions which are of great value, and the writers themselves refrain from influencing or supporting any particular line of thought.

Here is a quarry from which hosts of contending parties will get their stones to hurl at each other. The greater part of the work is devoted to a consideration of death duties, as the leading form of taxation of capital: the economic principles which are urged in their support, their prototypes in ancient history, their revival in Holland, and the gradual development of modern systems are fully set out, with liberal documentation. The Stamp Duties of 1694, like the Land Tax of 1692, were imposed as a temporary war measure, but afford a "striking example of how a legislative enactment "(almost unheralded and unnoticed at the time of its passing) may "influence future events." The influence of war conditions upon the development of ideas in taxation might in itself form a profitable study, and the lesson of "small beginnings" may not be lost upon the critics of preferential duties at the present moment.

In the historical portions of this work the authors are very little hampered by their resolution to exhibit no precise opinions of their own, and their treatment is full and well arranged. They do, however, conclude that in the Estate Duty we have a tax of a "thoroughly democratic nature." As against the common expression or truism that "taxes are paid by persons and not things," we read here that the estate duty is in the nature of a "tax upon "the property," and in principle knows nothing of distinction of "persons." It is true that in the Scripture phrase "it stands "between the dead and the living," and it may well be said that of all taxes it is the one whose application to the person as distinct from the thing is least obvious. It is now fashionable to regard it as a burden upon the deceased during his lifetime, represented by an annual tax equal to the insurance premium required to keep the whole estate intact at death, and no doubt to many it may really feel like such a burden. But it is also pretty certain that the beneficiaries swallow the insurance money whole, regarding it as something that was being provided in any case, and think of the estate duty as something which has definitely *reduced* the estate by so much, and therefore diminished their annual income from the estate, as a hidden tax. On the other hand, in the majority of cases neither one has really *felt* the tax in a true sense, and the phrase, "tax upon property," rather than upon the person, may pass with but a perfunctory challenge.

An interesting example of the range of literary reference that serves the authors is a quotation from Lord Rosebery's "Life of "Pitt," showing that Pitt had been greatly impressed by Adam Smith's well-known references to the duties in Holland, for the only letter addressed by him for months during a crisis in Holland to our Minister at the Hague was written with the sole object of enquiring as to the incidence of the Dutch taxes. Interesting, too, is the rare instance of a tax proposed in the first instance by those on whom it was specially to fall—the Corporation Duty—which was put forward by certain City livery companies as an equivalent for the death duties escaped by them. The authors bemoan the fact that this tax has "proved itself of greater value in upholding "a principle than in producing a revenue"— a remark which might well be applied to certain other more contentious and notorious imposts which have agitated the public mind since 1909. But the logic of the principle of the Corporation duty leads directly to the suggestion that the time has fully come when the rate of duty should be substantially increased.

The graduation of the duties is a most interesting academic subject. The original duties being *succession* duties, it is natural that the graduation by degree of relationship should be first considered, and this work gives adequate exposition of the several rival principles involved. Under the *privilege* theory, the privilege conferred by the State in providing a succession is all the greater the more distant or remote is the succession, and should be "paid for" accordingly. Under the *faculty* theory, the ability of near relations to bear taxation is less than that of distant successors, because the former have anticipated the succession and been educated in the expectation of it, while to the latter it is unexpected and capricious. A third theory, due to Bentham, and called the "sequence of inheritance," was closely connected with proposals for a revision of the law of inheritance. But it is the graduation of the Estate Duty by reference to the size of the estate to which most interest attaches. Does progression really rest upon the principle of "ability to pay"? If so, whose ability? If upon the testator's ability, then the tax is not a tax upon property, but upon a person. If upon the ability of the beneficiaries, then they have little to do with the *size* of the estate, and they may be rich or poor. This raises the question whether there is such a thing as "impersonal ability," the greater faculty of a large property. The truth is that progression probably rests quite as much upon grounds of public or social policy, such as the desirability of limiting large fortunes, and it is interesting to recall that J. S. Mill opposed graduation as a logical outcome of ability to pay, for income taxes, but accepted it on grounds of expediency for the estate duty. The French economist Colson was also willing to graduate death duties, while he objected to progression in other taxes.

This work contains a chapter on the classification of death duties as direct taxation, which, with a series of extracts, shows the divergence of view that has existed. This divergence will generally be found to have its origin, not so much in differing views upon the nature of these taxes, as in differences of definition of "direct" and "indirect." Another chapter summarises the chief results of investigations into the capital wealth of the United Kingdom by the income-capitalisation and by the "multiplier" methods, and also contributes some new matter to the subject in a clear statement of items which have to be estimated to supplement the latter to reach the total wealth, with particular reference to devices for evasion. The authors register the judgment that the "estates" passing in a year have no exactly calculable relation to the total privately-owned wealth, and the "multiplier" is not a statistical "constant, but includes an unascertained variable." Whatever view we may take as to the effect of *inter vivos* gifts, we should hardly agree with the dictum of a learned judge that property might for ever escape death duties by always passing *inter vivos* as a possible state of affairs so long as death took an impartial toll at all ages.

It would, of course, be impossible to avoid the capital levy in a work like this, but the treatment extends only to a brief summary of the proposal made, without any extended treatment of the several arguments. Besides a very complete series of statistical statements, there is a "prospective" survey and suggestions for reform. The three most urgent matters are more satisfactory checks upon the passing of bearer securities or stocks registered in joint names, increases in the rates of interest on duty in arrear, and the use of new annuity tables founded on modern mortality statistics. This excellent volume concludes with a chapter upon foreign death duties, and, taken as a whole, despite the authors' self-denying ordinance, is a most valuable contribution to the literature of taxation, which will possibly as a work of reference command the more confidence because it is free from controversial elements.

J.C.S.

2.—*Taxation in the New State.* By J. A. Hobson. xii + 254 pp., 8vo. London: Methuen and Co., Ltd. Price 6*s*.

The jacket of this book tells us that the chief purpose is "to "give a new and clear meaning to 'ability to pay' by indicating "what elements of income possess it and what do not, and to urge "certain reforms in our present taxation policy whereby the largest "revenue can be got without injurious effects on industry and "livelihood." Mr. Hobson's acute mind and ready pen have performed many services for popular economics, and it is clear that in this work he is again addressing himself to the many whom he wishes to educate in his ideas, and not to trained economists. It is therefore incumbent upon him to remember the first rules of this branch of his craft, and that trouble arising through multiplicity in the meanings of terms, particularly common terms, is the thing that makes economics a hard saying to many, and the science an offence. Some time ago, Mr. Hobson took up the words "earned" and "unearned," which were just obtaining a recognised significance in popular usage, and without due explanation proposed for them an entirely new connotation; after being associated, as they are in current taxation, with the presence or absence of personal effort, these terms were given a new meaning. Out of the wealth of his excellent teachings upon differential earnings of all the factors in production, and the recognition of that "surplus" or rent element, the annihilation of which would not affect the offer and service of the factor in question, he seized upon these words and bade them mean henceforth "necessary" and "unnecessary" in this functional sense. Professor Hobhouse followed, in a popular volume, and started this new mischief fairly on its course. Lord Hugh Cecil and others intervened with an ethical connotation: “ earned ” meant “ well-deserved,” and “ unearned ” of course signified “ ill-gotten.” Mr. Mallock has a special, or fourth brand of his own. Each writer makes no point of the change he is proposing, but proceeds with quiet confidence to commandeer the words as though there were no other claimants. What ideas the unsuspecting novitiate will have must depend upon the hands into which he first falls. Now Mr. Hobson did us no service when he joined in this confusion, but he has apparently forgotten all about it, for the “ surplus ” income is no longer styled the “ unearned ” income, but the income which has “ ability to pay.” It can safely be stated that the words “ ability to pay ” have now an accepted and definite reference to “ faculty,” and to the ideas of “ progressive ” faculty increasing with the aggregate amount of the taxable subject (income or estate), as based upon the principle of diminishing or marginal utility. Whether the words *ought* to have this association is not in question; the point is they are already in possession, and Mr. Hobson, without apology or explanation, pushes them out and fixes them elsewhere. We are bidden to understand that for the future we shall conduct an enquiry into the components of the income, and not think of its amount, before we decide that it has “ ability to pay,” which is purely functional. If he had been first in the field, and had staked out his claim, his title would have been clear and deserved. As it is, he merely makes for public confusion. To come along and assert that no one has hitherto found the true and appropriate meaning for a word, and that it is now supplied, may be journalistically attractive, but it is not helpful, and still less is it scientific. The curse of writers on science is of course that the chief effort of each is to invent a new terminology and then wallow in it. But even this is better than giving several different objects the same name. We cannot all write, after the word “ unearned,” “ (Cecil) ” or “ (Hobson) ” or “ (Dilke) ” to indicate the brands, nor should we now feel required when referring to “ ability to “ pay ” to add the distinguishing sign of a distinguished name. Frankly, Mr. Hobson ought to say openly that principle of ability to pay is not the proper one at all, the true thing to look at is not the ability but “ ultimate sufferance ” or “ final perseverance ” or whatever new term his ingenuity or fancy may aptly contrive to embody his idea. As it is, he is like a man who says, *sotto voce*, “ this stuff “ that is sold in bottles marked ‘ whisky ’ is not the excellent, health- “ ful liquid that people imagine, and Burgundy is better suited in all “ ways to the world's needs,” and then proceeds to empty all the whisky bottles and put in Burgundy, without changing the labels, hoping that the public will soon learn to like the new flavour under the old name. In the first part of his book, Mr. Hobson re-enunciates the doctrine of surplus in the clear and forcible way which is specially characteristic of him, drawing as he goes the corollary that taxation can rest nowhere save upon true surplus. It is like a ball continually rebounding from hard surfaces until finally it sinks in a “soft spot,” or like an up-to-date seeker after lodgings who knocks at many doors, sometimes stands in a hall, or even gets a bed for the night, but has constantly to move on till he finds a home. So Mr. Hobson is led to say that the analysis of costs and surplus disposes of old notions by showing that there are large classes of income which cannot bear a tax, and the classes of the population living entirely upon such incomes cannot contribute by taxation to the up-keep of the State.

He holds this doctrine as rigidly, if for different reasons, as any mid-eighteenth century writer upon taxes. A given class may appear to the community to be paying and bearing a tax, but all the time they are getting their own back out of the community by being less efficient and productive than they might otherwise be, not through malice aforethought, but from natural causes. Mr. Hobson is of course fully alive to the fact that the actual facts of life lie between the pure doctrine of shifting and the tendency for a tax to stick where it first lies, but it appears that he pays insufficient regard to one important fact. He assumes a world in which the net income required for a maintained supply of the agent (labour) both in willingness to work and for fullest efficiency is so spent as to give the fullest efficiency, and therefore that any limitation by taxation means something less to spend than, *ex-hypothesi*, fullest efficiency requires. Therefore taxation of this class reacts against the community, and the burden is shifted to others. But this is not the real world. Nearly every income is so spent that parts of it have no effect on efficiency, or have a minus effect, and few people work to the ideal point to which they might attain if they were perfectly wise spenders. If a tax depletes this portion of expenditure it may leave efficiency no further from the ideal than it was already, and therefore it is not shifted, but is borne by the payer. Only in a strained sense can we compare the position after the tax is imposed with a position that never exists in fact—we must compare it with a real world before the imposition of the tax. Indeed in so far as the State may be a wiser spender than the average individual—which Mr. Hobson might be expected to admit on occasion—the efficiency of the worker may be *increased* by the tax. The plain argument is that while hundreds of millions are spent on alcoholic drink, tobacco, gambling, and other objects which, however customary as a standard of living, have a net minus effect upon production, it is idle to allege that there is no “ability to pay,” provided the tendency of the worker to “ca’ canny” practices is not increased in the process of taxing him. At this point, Mr. Hobson possibly belittles the virtue of hidden or indirect taxes, though they may have most of the vices he attributes to them.

He throws out ideas on all sides, without too close regard to whether they are good, bad, or indifferent. In one place he suggests that our “taxing system should guarantee inducements in the “shape of tax exemption, to the allocation of large shares of business “earnings to the capital fund, so as to make good the letting down "of some important kinds of plant and the failure during the war "period to make normal provision for improvements. But all such "exemptions should be limited in amount and confined to the case of "vital industries, and a thorough scrutiny into the merits of each "application should be undertaken by the Income Tax Commis-"sioners." Here he seems to be quite out of touch with what actually has happened in regard to "failure to make normal pro-"vision"; he appears, too, to be oblivious of the fact that the last few years have shown more clearly than ever the absolute folly of any kind of State assistance or subvention by way of differential exemptions in taxation instead of direct and public allocations. Moreover, those very additions to reserve which are enabled by existing law in certain circumstances to receive partial benefits in taxation are roundly condemned elsewhere by Mr. Hobson himself.

Having elaborated the new "ability to pay," he suddenly and, of course, rightly concludes that it can never be realised as a practical principle of taxation, but takes comfort in the fact that this "ability "to pay" varies directly with the size of income, and there is a "presumption that a large income contains a large amount of "surplus, and that a small income contains none of this surplus," and so gets to the *status quo* in taxation by a circuitous route. We may go on with what we are doing, but we happen to be right for reasons which were not generally realized. The presumption breaks down in so many cases that the present writer would prefer to rest progressive taxation upon the original idea of "ability to pay." There are many incomes of 1,000*l*. per annum which are derived from dividends so high that no part of the capital would be withdrawn, or tend to be, if they were reduced. There are many incomes of 10,000*l*. made up of mere "subsistence" rates of interest, which have no "ability to pay."

Mr. Hobson would abolish "taxation at the source," because it gets in the way of his proposed reforms, and would ride over all the "stiff official bluff" and *ipse dixits* of experts. This part of his book calls for extended comment, or none. He appears to be ignorant of the fact that farmers' incomes are computed at twice the amount of their rent. He unfortunately gives currency, very forcibly, to quite erroneous ideas about companies' reserves escaping taxation; on p. 110, "Escaping publicity and income tax" by bonuses; p. 174, "Convert income into capital without paying tax on such elements of income"; p. 175, "If the shareholders took "their gain in the first way it would represent war profit, upon "which income or super-tax would be incurred by them, but if they "took their war gains in bonuses or new shares, they would incur "no such taxation upon the sum they received"; p. 176—"con-"tributing nothing to taxation." All this is dead wrong. *Income tax* at 6*s*. in the £ is payable on the whole profits, regardless of distribution in dividends. What is lost is the *super-tax*, where it would have otherwise been due on the dividends, and even this is partly offset by the lower rates of income tax that would have been finally borne by any receiving incomes below 2,500*l*. This book contains some of Mr. Hobson's best writing, but unfortunately it has also many blots besides those referred to, which are the result of over-hasty, journalistic jumping to conclusions, and desire for strong and positive conclusions. We owe so much to his past writings that it gives no satisfaction whatever to be obliged, in common fairness, to make adverse comments. If it savours of ingratitude he must be assured that quite opposite motives actuate us, and that his responsibility grows with his power. J.C.S.

3.—*The Problem of a National Budget.* By W. F. Willoughby. Director, Institute for Government Research. xiii + 230 pp., 8vo. London: D. Appleton and Co., 1918. Price 12*s.* 6*d.*

This book is a definite sequel to the valuable work, reviewed in this Journal last year, upon the British Financial Administration, by the three University Professors who came over as a Commission of enquiry and derived much guidance for American reforms. Students of the United States government seem agreed that their methods have hardly any of the requisite points of a proper system. There is no clear conspectus of the whole problem at any one moment; expenditure is not related to revenue, and there is no balancing of the account. The Secretary to the Treasury is a mere "compiling authority," who cannot control or change the proposals put forward by departments. "There is absolutely "lacking any organ at all corresponding in character or powers "to the Treasury under the British system. The idea that a "system of accounts should have for its purpose to produce in-"formation needed for the proper conduct of affairs as well as to "establish the fidelity with which legal provisions are carried out "scarcely exists." Even such a "balance sheet" as we are familiar with is wholly unknown and under present methods unattainable. The severe application of the doctrine of the "separation of the "powers" prevents the Government from having any systematic and complete view of the whole problem. The Congress and not the Executive determines the revenues to be raised and the expenditures to be made, but does not compel the Executive to give it any report of the past outlay or estimate of future requirements as the essential preliminary to its work. The author sees in the trinitarian unity of the British Ministry, in its legislative, executive, and administrative aspects, the secret of our success, but he seeks to show that American difficulties can be overcome despite this fundamental constitutional difference. For he holds that the "excellence" of our system is due rather to procedure than to constitutional system, and this procedure may be copied. France has a proper constitution for the purpose, and yet fails to evolve the required budgetary powers. The secrets of British success are (1) the non-interference of the legislature in administration; (2) the formulation of taxation proposals by the administration (through the Cabinet); (3) the presentation of financial proposals in a consolidated document considered by Parliament as a whole; (4) the continuously exercised functions of the Treasury in entire charge of formulation and of subsequent appropriation and execution, in a position superior to the administrative services proper. Unlike the Washington Treasury, the British Treasury does not attend to collection, custody, and disbursement of public revenues, but is responsible solely for direction, supervision, and control. While our system appears somewhat idealised, it cannot be denied that the lessons for America are soberly drawn. The President should formulate the Budget, and be provided with a special service through which he may effectively exercise his powers of general discretion and control. There should be a single Budget Committee in the House of Representatives. The essential difference between the two systems is that the functions of formulative and dictating action are vested in separate and independent authorities, the President and the Congress, and Mr. Willoughby now proposes that much of our Treasury work can be imitated by committees of the legislature.

An interesting development of his proposals is found in his treatment of subsidiary budgets for such genuinely separate services as the postal service, the Panama Canal, the Alaskan railways, the Bureau of War Risk Insurance, each of which is to be administered under a kind of board of directors. The net balance of profit or payment only is to be brought into the main budget.

The author makes some very ingenious and useful suggestions upon the presentation of budgetary material, and considers that the data regarding the cost of governmental operations should be given from at least five distinct standpoints, viz.:—(1) Funds; (2) organization units; (3) activities; (4) character of expenditure; (5) object of expenditure. This may be regarded as a consideration of statistical possibilities. It is illustrated by him in an appendix, which exhibits the actual expenditure of the Institute of Government Research under each classification. The division by "funds" is an obvious one, where special revenues have to be segregated. Then the cost of each operating unit, such as a subdepartment, a hospital, or a lighthouse, is necessary for administrative control and comparative purposes. The third division would exhibit the cost of protection against foreign aggression, as distinct from prevention and detection of crime, or education. The fourth must show capital outlay, fixed charges, and current expenses as distinct headings, and the fifth classified by salaries, transport, &c., over the whole field. The whole work is a most important contribution to an important subject, from which British administrators may learn a great deal. J.C.S.

4.—*Papers on Current Finance.* By H. S. Foxwell, M.A., F.B.A., Professor of Political Economy in the University of London. xviii + 280 pp., 8vo. London: Macmillan and Co., 1919. Price 10*s.* net.

Of the eight lectures or papers reprinted in this timely and valuable volume, two deal with the financial situation in the first eighteen months of the war; two are lectures delivered in 1909 on the Banking Reserve and the American Crisis of 1907; one is an address of 1917 on Inflation (with a summary of the discussion which followed its delivery); and two are lectures of the same year on the industrial struggle—dealing with trade organization—and the financing of industry and trade. An eighth reprint, in an Appendix, is a paper read to the British Association as long ago as 1888 on the growth of monopolies, and thus having a direct bearing in the problems discussed in the two last-mentioned lectures; and in a further Appendix is a brief letter of 1918 to the *Bankers' Magazine* on Fixed Exchange within the Empire.

The subjects treated in this group of papers are closely related, and present a consistent attitude towards certain features of British banking policy. The author can point to the fact that the lectures of 1909 on the Banking Reserve and the lessons to be drawn from the United States crisis two years before directed attention to defects which were not widely realised—or, if realised, not remedied —until the outbreak of war, and the panic among bankers, though happily not among the general public, since the banking reserve was so "economised" that "a 5 per cent. run on their huge deposits "would have broken the banks." In the lectures of 1909 Professor Foxwell urged that, in addition to the Bank reserve, there should be a second or emergency reserve, formed by the other banks in the United Kingdom, and even it might be a third reserve, against our more serious liabilities, formed at the expense of the nation, and called the war reserve, though not necessarily limited to war liabilities. At that time he wrote:—"I can imagine no greater "disturbance than that to which our market would be exposed "in the event of war between two first-rate Powers, more especially "if this country were involved." The misgivings with which he viewed such a prospect were amply justified by the events of the early weeks of the war events which are sketched in the first paper in the volume before us. That paper, and the one which follows, contain a good deal of criticism of the course then taken, and the general financial policy then pursued; and they contain suggestions as to the adoption of the method of continuous borrowing, in preference to "catastrophic loans"—"the larger the loan the "more artificial it must necessarily be"—the mobilization of securities marketable on Wall Street, and the issue of "premium "bonds," all of which have since found their places among our financial methods. The remark in March, 1916, that "to establish "habits of economy should now be the first business of the states- "man," is even truer now than it was then; and public habits since the armistice give, we fear, considerable force to the observation that "It will be extremely difficult to make England thrifty. "Thrift involves intelligence no less than self-control. Above all "it requires what is really the highest quality of mind. I mean "imagination. Nothing is harder than to actualise the future." To Professor Foxwell pressure of high prices or taxation are alone likely to secure the necessary economy; there is no evidence that it has been secured as yet—among a very large part of the population—by the rise in prices; and many readers will agree with Professor Foxwell that unnecessary consumption can only be prevented by much-increased taxation.

The subjects dealt with in the lectures on the nature of the industrial struggle, and the financing of industry and trade, have recently been very widely discussed. Professor Foxwell claims, with reference to his paper of 1888, reprinted in this volume, to have been "perhaps the first English-speaking economist to put "in a word in defence of business combinations," and he remains apparently still a whole-hearted advocate of them. He is a convinced supporter of Adam Smith's view that business competition, whatever it should be, is, in fact, a "species of warfare, of which "the operations are continually changing," designed, in Professor Foxwell's words, "to damage the economic power of rivals, whether "rival firms or rival nations." After setting out the three forms of competition—that which aims honestly at efficiency in production or service, that which seeks profit at all costs and by any means, fair or foul, and that in which fairly-matched competitors seek by all possible means to destroy the economic power of their rivals and the capture of their markets—he urges that the extent to which these two latter forms have dominated the world in recent years, and particularly the predatory competition developed by "some States" (*i.e.*, Germany), and the growth of great combines, necessitate the adoption of a national trade policy and a change in the British attitude—or, rather, the attitude of the State and the general public—towards industrial and trade combinations. He dwells on their advantages for attack or defence; their ability, as compared with smaller isolated concerns, to bring about economy of production, standardization, and the application of science to industry; and he looks to them as the most potent means of imposing and maintaining high standards in business. Whether this last expectation is entirely warranted by the known facts may be open to some doubt, and Professor Foxwell hardly touches on the problem of safeguards against abuses of power by the combinations—abuses which are not limited to the manipulation of prices. His only positive suggestion, now as in 1888, seems to be publicity; there are references to State control, but they are very indefinite.

The lecture on the financing of trade and industry is an elaboration of the text that "what we regard as 'banking' in England "is of a quite peculiar type, and is prevented, by the very defects "of its qualities, from discharging all the services rendered to "industry by 'banking' in some other countries": but that the resources are available and only need suitable organization to meet all the demands made upon them by the new industrial and trade developments sketched and advocated in the previous lecture. The establishment of such organization is essential for our success in the post-war economic struggle. "Even for England the effective "financing of her industries is of more importance than her international clearing business, and, indeed, is a primary condition "of her mastery of exchange and her continued hold of the international position." He contrasts the action of the English and German banks and the *rôle* played by the latter in the development of Germany's industries and overseas trade, and points out that whilst the great issue houses in this country discharge to some extent the functions taken upon themselves by the German banks, they "fight shy of ordinary home industrial propositions," since "as "a rule our English industries are too small in scale" to attract them. So we come again to the necessity of large-scale business (*i.e.*, combinations and consolidations) and to the necessity for the provision of ample finance to make large scale undertakings possible. This provision, he thinks, must be made "outside, though not "out of relation to, the existing system of the deposit banks." Professor Foxwell's discussion of the whole problem is illuminating and suggestive, and calls for serious consideration by all concerned in the task of re-establishing British commerce and industry.

P.A.

5.—*Principii di Economia Commerciale.* By Gino Arias, Professor of Political Economy at the University of Genoa and Lecturer at the Higher Institute of Commercial Studies, Genoa. 948 pp., 8vo. Milan: Società Editrice Libraria, 1917. Price 25 lire.

An apology is due to Professor Arias and to readers of the *Journal* for the tardy appearance of this notice of the Genoese professor's important work. But as the subjects dealt with are of permanent and not merely transitory interest, and as wide historical learning, combined with acute analytical power, is displayed in the treatment of them, it is not out of place to direct attention to the principal contents of the book, even though some time has elapsed since the date of its publication.

In a short but interesting introduction, the author emphasises the necessity of regarding the economic as merely one section of the wider group of social and political activities, and he utters a warning against the errors inherent in the view—a view, as the author tells us, not shared by the greater economists—that a true knowledge of the conditions which govern the economic form of a society can be gained, if due account is not taken of the extra-economic influences which affect mankind.

The body of the book is divided into seven parts. In Part I brief but illuminating sketches are given of the attitude to commerce and the motives inspiring commercial policy in certain important communities of ancient and mediæval times. Part II deals with value and prices and contains a critical exposition of modern theories. The remaining five parts contain a close analysis, with constant reference to concrete examples, of the various forms which the organization of commercial and industrial undertakings assume in the world of to-day; of speculation and the part it plays in modern commerce; of money, banking, and the instruments of exchange; of commercial policy in regard to international trade, and of transport by land and by sea.

The section on value includes appreciative reference to the current writings of English economists, with useful criticism on special points where it appears to Professor Arias that the writers have not kept their theoretical speculations sufficiently close to practical life. And, indeed, the whole work shows wide knowledge of the leading modern writers in all countries on the various subjects treated.

While Professor Arias is on the whole remarkably impartial and objective in his views and criticisms, it may be suggested that, in Part VI, on commercial policy, he attaches excessive importance to the political as distinct from the purely economic aspects of foreign trade. At the same time, he tends to simplify unduly the conception of the State as a metaphysical person distinct from the individual persons comprised within it, and to neglect the fact that the State includes numerous groups and classes with divergent and conflicting interests. Hence, in this part of his work, the author is inclined to exaggerate the importance and the evil of dumping in international trade and international relationships. But in discussing the actual effects of the commercial policy of the principal modern countries, the author is very judicial, rebuking alike the more extreme and extravagant dogmas of the protectionist and free trade schools. And he is careful to distinguish between the results of a protective policy in Germany and the United States, for which it is possible to claim a certain measure of success, and those which have flowed from the ignorant and misguided application of protectionist theories in France.

It would be impossible in a short space to discuss in any detail the wide field covered by Professor Arias in this exhaustive work. By his method of treatment he has given unity to the branches of "commercial economy" which form the subject matter of the several chapters, and his book will be found to be a reservoir of critically collated facts and theories both by contemporary students and by future historians of political economy. S.L.B.

6.—*Introduction to Mathematical Statistics.* By Carl J. West, Ph.D. 150 pp., 8vo. Columbus: R. G. Adams and Co., 1918.

The first five chapters of this book discuss the common averages and measures of dispersion on familiar lines. In the sixth chapter some of the properties of the normal curve are described, but the appropriate methods of testing goodness of fit are not introduced. Chapter VII deals with a correlation table: the definition of correlation on p. 73 is unsatisfactory. Chapter VIII takes up the correlation ratio; a misprint in the second table on p. 78 may give the elementary student some trouble. Chapter IX returns to the coefficient of correlation. In our opinion, this discussion should not have been separated by several chapters from that contained in Chapter XII, and, for elementary students, it is desirable to point out the significance of the coefficient of correlation from the standpoint of least squares.

Chapter X discusses correlation of ranks, Chapter XI the method of moments, Chapter XIII contingency ; the necessity of correcting the correlation ratio for grouping and the limitations attaching to its significance might have been brought out more clearly. In an appendix some of the properties of Professor Pearson's curves are developed.

A good many examples for practice are given, but they are not very well selected, trivial, and, to the beginner, difficult, exercises being included. No attempt is made to deal with partial correlation. The best feature of the book is its insistence upon the importance of the correlation ratio, while Dr. West gives several practical cautions which will be useful to the kind of student who tends to regard mathematical formulæ with the confidence which, according to Todhunter, inspired Condorcet. Upon the whole, however, we do not think the book can challenge comparison with well-known English manuals.

It is, we suppose, idle to object to "thru" and "thoroly," but we are obstinately convinced that "data" mean more than one object, and that "to approximate" is an intransitive verb.

M.G.

7.—*Indian Industrial Commission*, 1916–18—*Report*. Calcutta : Superintendent Government Printing, 1918.

Several highly interesting reports upon Indian matters have been issued of late and among them none more valuable than this compact volume. The authors steadily keep their feet on the solid ground of ascertained fact, and guided by close acquaintance with the conditions with which they have to deal, and high technical experience, they herein suggest a course of State action which justifies the somewhat vulgarized title of epoch-making. Three years ago the Government of India decided that "the time had come when the question of "the expansion and development of Indian manufactures and indus"tries should be taken up in a more comprehensive manner than had "hitherto been attempted." They recognized the numerous difficulties to be overcome and that these required full examination by men of technical experience and high business standing, so they promptly appointed a Commission of members possessing those qualifications. Half a year after the Commission had entered upon its work its task was materially stimulated and made easier by one of the many unexpected developments of the war. The difficulty of obtaining munitions and other necessaries of war from Europe made the local manufacture of these vitally important. The President of the Commission was appointed to organize a Munitions Board, which, in controlling the purchase and manufacture of all the articles required, enabled the Commission to test the manufacturing capabilities of

India and also to give effect to many of the conclusions at which it had tentatively arrived. In fact, that Board, in the words of the report, "is our principal witness."

In the Report, the Commissioners begin with a summary of the conditions of the industrial field the development of which is the goal to be attained. They do not claim to present an industrial survey of India; nevertheless, they have set forth the leading features of the situation in a way which affords sufficient information as to its resources, the use made of them, and the general tendencies of industry and commerce to enable a reader, even though unacquainted with the country, to appreciate the measures for their exploitation on modern lines proposed in the rest of the volume. Space does not allow of quotation, but it may be mentioned that the Commission has done well in driving home the fact that India has never been a manufacturing country. In the "golden age" of Indian crafts, so often appealed to by Indian writers and politicians, skilled workmanship was confined to articles of luxury, produced under the patronage of the local Court, and did not enter into the general consumption. The simple wants of the village were supplied, as they mostly are now, by the elementary handwork of the artisans who form an integral part of the village community.

Agriculture has always been the premier occupation of India in both practice and sentiment. The Commission lays strong emphasis upon the paramount importance of its products in the future of nearly all Indian industries. It is conducted, however, inefficiently on the whole, and upon lines wasteful of labour and material. The Commission, therefore, strongly urges the need of greatly extending the scientific research and experiments initiated by the Government, and of encouraging the substitution of modern methods and machinery for the antiquated system now in force, the object being to get a larger output and more valuable produce, reducing, too, the excessive amount of labour now lavished on the soil. Much of the labour thus released, it is suggested, could be utilized in manufacturing before export a good deal of what is now sent abroad in its raw condition. Room for still more hands could be found in working up the numerous mineral products of India, hitherto almost untouched, and in bringing into full use the treasures of the forests, now worked up to little more than half their potential value.

The village community lives for and by cultivation, but the Commission does not fail to deal out fair measure to its body of artisans, mentioned above, who, with some unfortunate exceptions, have shown amazing vitality in holding their own against the severe competition of foreign manufacturers to which they have been subjected for several generations. Their survival, therefore, may be assumed to be due to their adaptation to their surroundings, or, in the words of the report, because, first, they produce commodities which are in demand and have not, so far, been displaced by factory-made goods, and then, because they work under conditions which they prefer to factory life. Moreover, in some respects they have moved with the times, in taking advantage of modern implements and materials. The Commission proposes, accordingly, that sound education and technical training should be brought within their reach, that small factories under experienced master-workmen should be fostered, that financial assistance through co-operative or credit societies should be organized amongst them, and that new and accessible markets should be opened to their products.

The village has been dwelt upon here at some length because it is the unit in which the vast majority of the inhabitants of India live, move and have their being. The healthy development of the industrial powers of the country all along the line, therefore, must reach the stratum where it is most in touch with the traditions and sentiments of a stay-at-home and uneducated population. It is probable, however, that the promotion of the higher and more specialized forms of enterprise will be deemed to have the first claim upon the State. The path is easier and the results sooner ascertained. The report, accordingly, enters in full detail into the arrangements proposed in regard to research, education, both technical and commercial, and advice and experiment in new industrial adventure. It recommends the establishment of a Central Department, responsible for policy and inauguration, whilst the actual administration is to be decentralized Provincially, under the close supervision of the Imperial Board. The agency required is a large one, and special attention is directed to the need of getting men with the best qualifications possible in each branch, which is, apparently, a task of some difficulty at present.

It will be noted that the action to be taken by the State throughout the ground covered by the scheme extends far beyond the narrow limits imposed by Lord Morley and his successor. The ice was broken by the success of the Munition Board, and in the report stress is laid upon such factors as the shyness of Indian capital to embark on any venture outside the old lines, and its occasional justification in the ignorance and inefficiency with which some of these attempts have been launched. On the other hand, nothing succeeds there, as elsewhere, like success, and this want of initiative and financial pluck can be made good, it is urged, by the State taking the first plunge under all safeguards of inquiry and experience. The case is undoubtedly a strong one. There is no principle of universal applicability involved, and even in the highly developed States of the West, as has been seen of late, policy follows necessity. Still more are the initiative, stimulus and guidance of official agency advisable where vast natural resources are lying ignored owing to want of knowledge of their uses and how to take advantage of them. There is, it is true, the risk that as time goes on, a highly efficient State Department may prove not elastic enough to keep pace with contemporary changes or progress, as Mr. Wolf suggests in his recent work on co-operative banks in India. The Commission has provided, however, the close co-ordination of State and non-official experience on both Central and provincial bodies, and moreover, the general awakening of the country of late does not indicate a tendency to hug closer any official chains. It is open to question, too, whether the creation of this large and influential new organization will not turn out one of the difficulties in the way of the full adoption of the scheme. In sundry places the new Department impinges on an older one, and departmental self-esteem dies hard. The educational proposals of the Commission are here to the point. The higher branches of technical education have been the subject of inquiries, the results of which have not yet been considered by the Government. They were placed, consequently, outside the purview of the Industrial Commission. It is possible, therefore, that these conclusions, derived from different points of view, may clash with one another. Again, in regard to the proposed transfer of part of higher technical education from the Department of Public Instruction to that of Industry, the Commission is in conflict with an important phase of caste sentiment and interests. This will be apparent to those who can read between the lines of the able Minute recorded by Pandit M. Malaviya, and it will take some time and controversy to get the test of practical capacity above that guaranteed by the hall-mark of literary examination.

Another lion in the path with which the Commission was forbidden to grapple, is the competition of imported manufactures with many of those the production of which within India it is the main object of the Commission to establish or extend. The demand for the protection by tariff of "infant industries" is almost universal amongst the educated classes of India, who have to count upon the equally strenuous opposition of the powerful shipping interests and other "convinced free traders" of this country. A change of policy in this respect would, as the Government of India sapiently put it in their instructions, "very directly affect the fiscal relations of India "with the outside world." It is something to see recognized as a policy what has hitherto been an article of faith.

It should be pointed out, in these days when reconstructive authorities think, like astronomers, in millions, that the Commission estimates the capital cost of what may not inappropriately be called the first steps in an industrial revolution, at not more than a million, with half as much more spread over the first seven years, and recurring charges of, in the aggregate, about 600,000*l*. J.A.B.

8.—*I Fattori Demografici del Conflitto Europeo.* By Lanfranco Maroi. Con introduzione di Corrado Gini. 595 pp., 8vo. Roma: Società Editrice "Athenæum," 1919. Price 18 lire.

Professor Maroi states that the aim of his book is to examine as completely as possible the phenomena of population in relation to the war, and in the introductory chapter he suggests that in these phenomena may be found the primary causes of every war. This idea is expanded in an ingenious and interesting manner in Corrado Gini's preface, which, however, makes little attempt to bring the hypothesis into relation with the available figures, but takes the line that since the ostensible grounds of war have changed their character in each historical period, the inference is that some fundamental force was always the prime, though perhaps the unconscious motive; and that a demographical one best satisfies the conditions. The material necessary for estimating the value of this theory is embodied in the detailed facts and statistics which make up the bulk of the volume. These, again, are not definitely built up by the author into evidence of his contention, but are, as it were, the bricks with which the reader is invited to experiment. In a general sense, it is easy to refer the recent conflict to the expansion of the German nation and its consequent desire for a profitable outlet, but the precise relation of all the complex demographical facts to the outbreak of war is an exceedingly difficult matter to estimate.

It is certain, at all events, that the Government causes of most, if not of all wars lie deeper than the acknowledged motives; specific grievances and sudden events bring about a war only between nations already in a state of antagonism, conscious or sub-conscious. Germany's decision for war in 1914 was not the result of momentary conditions but the outcome of a whole policy, itself determined by the special manner of the nation's development and its relation to that of other powers. In short, the war is generally recognized to have been the sudden boiling over, at a critical point, of Germany's economic and political ambitions—that the fire may have been deliberately heated does not vitiate the truth of the assertion. It can be shown that the economic and political factors were closely related to, and may even be regarded as a manifestation and a consequence of, the underlying demographical conditions. The question is by no means simply numerical. Disturbances arise, in the political as in the physical world, from a want of equilibrium, and demographical equilibrium, both as between different parts or grades of one nation, and as between separate nations, is unstable. When the balance is sufficiently tilted, political changes, if not actual war, inevitably follow. What is called by the author the *ricambio*, *i.e.*, exchange, between the various social classes, plays a very important part in the balancing process, and this continuous transference is in the main an ascending current from the lower and more prolific strata to fill the gaps in the less fertile classes above.

Professor Maroi has made an elaborate study of population movements in the lately combatant nations, and has given much attention to the phenomena of emigration and immigration. As might be expected, a large part of the work is devoted to the history of German immigration, the peculiar character of which is appropriately described as infiltration. The deliberate organization, during the last thirty years or so, of this movement in the interests of German predominance seems at first to contradict the theory of a genuine demographical "urge" for war; but it is fairly argued that the vigorous growth of the population, in contributing to the prosperity which followed the Franco-Prussian War, at once induced a greed for power and dominion, and presented the means of gratification. It is notable, by the way, that German immigration diminished during the period of the greatest natural increase. This began in the nineties, and coincided with the great industrial, commercial, and agricultural expansion made possible by the conquests of 1870, and the unification of the Empire, so that the excess population was easily absorbed in production. But if the stream of emigrants was quantitatively less—and, in fact, it steadily diminished down to the date of the war, falling from 120,000 in 1891 to 18,000 in 1912—its quality was of the greatest importance. The effects of both emigration and immigration depend on the relative conditions in the countries concerned. Emigration is stimulated in a vigorous expanding population, whose surplus energy goes to increase the prosperity of newer and less populous countries. But emigration also takes place from countries which, poor demographically, are yet poorer in the means of subsistence; and such emigrants, drawn from the lowest social layers, fill the lowest places in the country where they settle, while the land they have abandoned grows weaker still, and becomes liable to invasion by strange races. A case in point is the German immigration into Poland, where, of course, political factors were chiefly responsible for the conditions which invited and enabled it; and the difference between Italian and German immigration in the United States affords another illustration of the principle. German immigrants in all countries are drawn from efficient classes—skilled workmen, technicians, professors and teachers, well-trained clerks, actual or potential heads of businesses, and they have everywhere tended to form well-organized national groups, retaining their German character and customs and maintaining, usually, a close relationship with the Fatherland. Professor Maroi lays great stress on the influential character of his "colonization," but the actual results seem to discount its importance as far as the war is concerned. On the contrary, the war would seem to have interrupted a process of peaceful conquest, for the infiltration into other lands bid fair to end by securing the industrial and commercial supremacy of Germany. Apparently, when war broke out, the Germanization had not gone far enough to determine the issue or to affect, to any vital extent, the policy, for instance, of the United States. Professor Maroi does not touch on this ineffectiveness, but the failure of the Germans in America to fulfil their Government's expectations may presumably be attributed to the assimilative capacity characteristic of the American as of all young and strong nations, and to the fact that the definite organization of the German immigrants is of comparatively recent growth. The earlier generations were more easily absorbed, and much intermarriage took place so that of the 16,000,000 or so persons in the United States with German blood only 8,000,000 count as "German Americans," and of these only half are German born. The effective pull of the Fatherland in a powerful country like the United States may be expected to lessen rapidly in the case of those immigrating for the sake of their own advancement, however loyal they may appear as regards sentimental accessories. But, the war apart, there is no doubt that the character of German immigration—quasi-colonial, in other peoples' lands—has worked to Germany's advantage, in contrast to the state of France, whose colonies, as Professor Maroi shows, were a source of weakness from the time when the decrease in her birth-rate rendered her unable to colonize them effectively. This was the real reason why, in the eighteenth century, they were taken from her with comparative ease. In the same way, England's colonial success is attributed by the author to an almost perfect balance between her population increase and the economic and territorial expansion for which it was instinctively utilized.

The grave decrease in the French birth-rate may be considered to have played a large part in Germany's determination for war; it multiplied the value of the German numerical increase (which had been so far maintained in spite of a steadily decreasing birth-rate) and tempted invasion both by making it appear tolerably easy, and by the exhibition of a rich but sparsely populated land under the nose of a people closely packed on a much poorer soil. The numerical inferiority, moreover, resulted in an intensified military inferiority—one not only of number but of efficiency—since the standard of efficiency had to be lowered in order to maintain the French Army even in that proportion to the German which it bore in 1914. The difference in average quality may be measured by the fact that France was recruiting 79 per cent. of her male population against Germany's 30 per cent.

The motive at the root of German infiltration is particularly well exemplified in the case of Belgium, where there was no question of surplus space beckoning to surplus population. The immigrants insinuated themselves into an already teeming area, and the immigration, as the war clearly showed, was of a purely economic and political character—was, in fact, designed to end in Belgium's economic union with or subjugation to Germany, and also in her conversion into a military vantage-point of the Empire. There is no space to show how Professor Maroi traces the course and methods of German infiltration in these and other countries, including Holland, Switzerland, Denmark, Russian, Turkey, Africa, and India. His statements are supported by a mass of figures and by citations from other writers, and the facts are brought out in an interesting and striking way, though there is a certain amount of repetition. A new side of the subject enters with the application of the author's theory to Austria-Hungary, where the "demographical factor" is not concerned with emigration, but with the clash of nationalities inside the Empire. In other words, the "in-equilibrium" was internal, and, as in the Balkans, chiefly a question of "irredentisms."

In conclusion, it should be mentioned that the book is marred by a number of printer's errors in addition to those noted in the list of *errata*. Many of the mistakes occur in English and French words, but several figures are also misprinted. C.T.

9. *Russia. A Study Social and Industrial.* By A. N. Drew. 188 pp. London: Simpkins, Marshall, Hamilton, Kent and Co. Ltd., 1918. Price 3*s.* 6*d.* net.

Commercial Russia. By William Henry Beable. 278 pp. London: Constable and Co., 1918. Price 10*s.* 6*d.* net.

The output of books offering "interpretations" of Russia and its peoples to British readers, or surveying its economic resources and the field which its presents for British commercial enterprise, is becoming very large, and presents a pleasing diversity, in respect of both the length and depth of the authors' knowledge of the country of which they write. This diversity is well illustrated by the two volumes before us. Mr. Drew claims to have been engaged in business in Russia for twenty-five years, and to have an extensive knowledge of Russian, the result of a "fortunate linguistic faculty." Apparently Mr. Beable's only visit to Russia was one of six months' duration in 1916; he started with a very slight knowledge of the language, and though he covered much ground and has consulted a good many authorities, it is obvious that the knowledge on which his book is based cannot be more than superficial. Mr. Beable remarks that "the marvellous changes of the past few years have "entirely altered the whole situation in Russia. The man who "'knew Russia' before the war does not know it now." This might be advanced as a reason for relying on the new observer more than the old, if it were true. But national characteristics do not change rapidly, however catastrophic political changes may be; particularly is this the case in a country whose peoples, as both Mr. Beable and Mr. Drew point out, are to a large extent oriental. Mr. Beable's book contains a substantial amount of information, though little that is new, and it may be useful to those manufacturers and traders to whom Russia has hitherto been little more than a name. It will tell them something of the geographical facts of Russia (the map at the end is too small to be of any value), about train services and the character of the hotels, the commercial practices and law before the Revolution, and the markets for various kinds of British goods (as to which liberal use is made of Consular Reports): and so regarded it has distinct merits. But it is all on the surface, and, as is the case with other works of its class recently published, its value as a guide to the new Russia now being shaped may be doubted.

Mr. Beable was convinced that the Russian tariff after the war would discriminate in favour of the Allies against the Central Powers. It may be noted that on p. 5 "it is fairly certain" to make such discrimination, whilst on p. 7 "discriminating duties "will undoubtedly be levied against the Central Powers"—a striking instance of the rapid growth of faith. The financial position of Russia is stated, on p. 11, on Russian authority, to be very far from alarming. This seems to have been written in January, 1918, when, as Mr. Beable admits, the political position was extremely obscure and he was reluctant to venture into prophecy;

but he shared the confidence of a good many observers at that time, and to-day, in Russia's political recovery and rapid economic development.

We observe that on p. 3 Mr. Beable has the following passage :

" Incidentally, I would recommend anyone to approach the " Foreign Office rather than the Board of Trade for any assistance, " even in commercial matters. The support asked from the latter " department, and refused, was readily granted by the former. " The Commercial Intelligence Department of the Board of Trade, " under its present political administration, is of very little help " to the British manufacturer, and its information, when it has " any to give, is usually qualified and of little value, if not " entirely unreliable. It is now demanding a fee of ten guineas " a year for information that should be available free to any " British manufacturer from a public department supported by " taxes."

We have no wish to make this passage a test of Mr. Beable's general accuracy, but it must be pointed out that at the time he wrote the Commercial Intelligence Department had become the Department of Overseas Trade ; that it was as much a Department of the Foreign Office as of the Board of Trade ; that its information was derived from the Diplomatic and Consular Officers of the Foreign Office ; that the " political " administration of the Foreign Office was the same as that of the Board of Trade ; that every British manufacturer who applied for specific information obtained it then (as now) free of charge ; and that the Department has never at any time demanded a fee of ten guineas a year for information. A fee of *two* guineas is charged to manufacturers who desire to have information sent to them regularly, but this covers a subscription to a Journal published at 6*d*. a week.

Mr. Drew's little book is of quite a different character. Two-thirds of it are devoted to an " interpretation " of Russian life and character ; the remaining one-third deals briefly with taxation, industrial and commercial conditions, agriculture, forestry, minerals, and miscellaneous industries—all are only lightly touched upon and statistics are avoided. The really valuable portion of the book is the first part, in which Mr. Drew discusses a number of social and political questions, which are sufficiently indicated by such Chapter headings as " Mysticism," " Character," " Morality," " Education," " The Jewish Problem," " The German Russians." It is an unpretending volume, but more really illuminating than many of the books on Russia which we have read, and under the somewhat inappropriate title of " The Evolution of the Tsardom and the Cult " of the Tsar " there is a very suggestive (if limited) study of the Russian peasant and a really graphic little sketch of a typical village. And Mr. Drew shares Mr. Beable's optimism.

P.A.

10. *The Control of the Drink Trade in Britain, a Contribution to National Efficiency during the Great War,* 1915-18. By Henry Carter, with a Preface by Lord D'Abernon. Second Edition. xix+313 pp., 8vo. London: Longmans, Green and Co., 1919. Price 4*s.* 6*d.*

"Drink is doing us more damage in the war than all the German "submarines put together." "We are fighting Germany, Austria, "and Drink: and, as far as I can see, the greatest of these three "deadly foes is Drink." These words, spoken by Mr. Lloyd George in the early part of 1915, rang through the country, and their quotation now will recall the controversies waged over the drink question in those early days of the war, and the gropings of the Government to find a means of checking and diminishing the evil. For evil it undoubtedly was. Examples were adduced by the Government of its effect in reducing the output of goods and services required for the prosecution of the war, and though these examples were angrily declared by labour leaders to be grossly partial and exaggerated, the state of affairs indicated by them was so serious as finally to compel drastic action on the part of the Government. At first the Government moved timidly—or was it warily?—for opposition was great and determined. Restrictive powers were, of course, exercised by the War Office and Admiralty over drinking by members of the Forces. A small legislative extension was secured of the powers of the Licensing Justices over the closing of public houses; appeals were made to patriotism and public spirit; the "King's pledge" to abstain from alcoholic liquors during the war was taken by numbers of people. All this, however, was simply "nibbling" at the problem, and in April, 1915, the Government boldly produced a plan for reducing the consumption of alcoholic drinks by heavy increases in the Customs and Excise duties, and for controlling completely the liquor traffic in areas where war material was produced or transported, and where men of the Forces were encamped. The tax part of the scheme was so strongly opposed, particularly by the Irish Nationalists, that it had to be abandoned, but the "control" proposals were saved, and out of them emerged the "Central Control "Board (Liquor Traffic)," established, under the chairmanship of Lord D'Abernon, in June, 1915.

The main part of the book under notice is a record of the problems that confronted the Board, and of its methods of tackling them. As the author, himself a member of the Board, rightly points out, the Board was not appointed to evolve and apply a temperance policy, but to safeguard and increase the efficiency of labour in all processes concerning the conduct of the war, so far as this efficiency was threatened by "the lure of drink" and the absence of proper facilities for securing wholesome nourishment.

The country is familiar with most of the measures taken by the Board to fulfil its purpose. The hours of sale of alcoholic drinks were sharply curtailed, in Scotland to less than half the normal, and in England and Wales to about one-third; "treating" was prohibited; the "*bona fide* traveller" ceased to be able to refresh himself outside the authorised hours of ordinary sale; whisky became anæmic. On the constructive side the Board, in some localities (Gretna, Carlisle, Enfield, and Cromarty Firth area), became sole vendor of alcoholic drinks, and it established and maintained canteens. Among its less well-known, but by no means least useful, activities, was the appointment of an advisory committee to investigate scientifically the effects of the consumption of alcohol on the human organism, and more particularly on health and industrial efficiency. By the time the Armistice was signed in November, 1918, over 38,000,000 of the population of Great Britain were subject to the Board's orders (the Board did not exercise its powers in Ireland).

The Board's doings and its methods of functioning, from its inception down to March, 1917, are faithfully chronicled by Mr. Carter, and with sufficient detail to make the record a highly valuable social and historical document. (Some Orders subsequent to March, 1917, are quoted or summarised in Appendices.) Mr. Carter is evidently satisfied with the Board's accomplishments, and both the evidence recounted in the book, and general observation, enable it to be safely affirmed that the Liquor Control Board (to give it a less cumbersome title) has justified its appointment and "made "good." Mr. Carter ends with a plea that the experience gained by the Board in the matter of State control of the drink trade shall not "go for naught" in the years to come, when the Arts of Peace will make no less demand on national effort than the Art of War has done.

Two small suggestions may be offered in order that a future edition may enhance, if only by a little, the already great value of the book. In discussing the consumption of spirits and beer in recent years (page 255) figures for financial years (ending March 31) are used, in which "forestalments" of spirits are a disturbing influence. Mr. Carter gives no hint of the extent of the forestalments, and as calendar year figures are (nearly always) free of this complication it might have been better to have used them. The second suggestion is that, since the book will undoubtedly become a standard work of reference, it would be useful to expand the highly condensed summaries, given in the Appendices, of official Orders relating to the supply and control of drink since March, 1917, and give a fairly detailed account of these Orders. A.D.W.

11.—*Co-operation for Farmers.* By Lionel Smith-Gordon, M.A. (Oxon.). xiv + 217 pp., 8vo. London: Williams and Norgate, 1918. Price 6s. net.

As Assistant Secretary of the Irish Agricultural Organization Society, and Secretary of the Co-operative Reference Library, Mr. Smith Gordon is well qualified to describe the origin and progress of the excellent movement for agricultural co-operation in Ireland due to the energy and foresight of Sir Horace Plunkett. He informs us that over 1,000 societies, with more than 100,000 members, have been organized. Of these, there existed in 1916 356 co-operative creameries, with a turnover of 4,500,000*l.*; 234 agricultural societies, with a turnover of 481,000*l.*, and 224 credit societies, whose loan capital amounted to 50,000*l.* In addition, there were 101 other societies of the class in Ireland, and the total turnover of the movement is estimated at 8,000,000*l.*

Similar agricultural organization societies have been established in England and Scotland, and the extent of their activities may be inferred from the fact that of the 179 industrial and provident societies registered in 1916, 68 were affiliated to the English Agricultural Organization Society, founded 1901, 27 to the Scottish, founded 1905, and 39 to the Irish, founded 1894. Comparing the returns of 1916 with those of 1913, as published by the Chief Registrar of Friendly Societies, the number of agricultural societies increased from 798 to 1,011, their total sales from 5,396,600*l.* to 11,009,000*l.*, their sales of produce from 3,321,000*l.* to 6,407,000*l.*, the surplus on the year's working from 39,000*l.* to 177,000*l.*, and their share and loan capital from 627,000*l.* to 816,000*l.*

It will be seen from these figures that, since the impulse given to the movement by Sir Horace Plunkett, it has assumed a different form from the various earlier attempts at co-operative farming, which in general were failures; and it is one of the merits of Mr. Smith-Gordon's useful book that in brief space it not only sets forth the history of that movement, but also gives much practical guidance to those who may be disposed to embark on it, which may protect them from a similar experience to that of those early attempts. In times like the present, when the future of all industries is uncertain, a work assisting in the promotion of co-operative enterprise upon sound lines should be especially welcome.

E.B.

12.—*Unemployment and American Trade Unions.* By D. P. Smelser, Ph.D. 154 pp., 8vo. Baltimore: Johns Hopkins Press, 1919.

This monograph is Number 1 of the Thirty-seventh Series of Johns Hopkins University Studies in Historical and Political Science, and was prepared by the author while a member of the Economic Seminary of that University. He has since then supplemented the information thus gained by personal enquiry of the officials of American trade unions. The statistics of unemployment which have from time to time been collected by the Federal Government and some of the States of the Union are, in his opinion, of doubtful value. They show fluctuations from month to month and from year to year, and disparities in the returns obtained by different States, that render them inapplicable for practical use. The attempts of individual Trade Unions to collect statistics of unemployment from their members have also frequently failed. The only data of this kind which he found it possible to utilise in his study of the question were those of the Bricklayers, the Pattern Makers, and the Flint Glass Workers. From these he deduces the conclusion that the generalization of Sir W. H. Beveridge that "trades most "regularly affected by seasonal movement from month to month "are those least affected by cyclical fluctuation from year to year," does not hold true for the United States; but it may be doubted whether further enquiry would support this view.

The policy of the Trade Unions with regard to unemployment has been directed towards the regulation of the number of workmen among whom the employment is to be divided and the increasing the total amount of employment. Their action in the first direction has been built upon the work fund theory; they have agitated for a restriction of immigration, and even discouraged additions to their ranks. In the second direction, they have endeavoured to restrict output, to shorten the normal working day, and to regulate overtime. Dr. Smelser gives many instances from the rules of the unions of the manner in which these several methods have been pursued. He doubts whether restriction of output affects unemployment to any extent. Trade Unionists admit that the shorter working day has not done so. The abolition of overtime has had the contrary effect to that expected by the Trade Unions.

Few trade unions have organized employment bureaux; but some of the larger unions employ a business agent, one of whose activities is to fulfil the function of such a bureau. The business agent goes further than the ordinary employment bureau official, who has to wait in the office for offers of employment; for he goes about to discover opportunities, and, being a specialist with a perfect knowledge of his own trade and of the members of his union, is more efficient. His services are of value to the employers as well as to the men. The men themselves are bound by the constitution of their unions to assist each other to secure employment. They meet at the headquarters of the union to discuss the prospects of their trade.

State employment bureaux were first established by Ohio in 1890, and since then 22 States and 25 cities have created similar agencies; but Dr. Smelser is of opinion that the Trade Unions would have an advantage over other existing employment bureaux in connecting their unemployed members with employers in need of men, if they would only fully develop their resources in that direction. He describes in some detail the methods adopted by certain unions to obtain employment for members in places where there is a demand for it. They have organized a system of travelling loans and benefits. The report of the American Federation of Labour gives 250,000*l.* as the amount expended for this purpose in the thirteen years 1903–15; but the author considers that the system has been, generally speaking, a failure. The statistics of the Cigar Makers' Union given for the year 1914 showed: Loans, 10,215*l.*; amount unpaid, 21,844*l.* The Leather Workers discontinued the practice in 1905, after seven years' working, during which they had lent

3,413*l.* only. Dr. Smelser discusses at length the causes which have operated to hinder the movement of unionist workmen from one city to another, and the methods which have been adopted to secure by other means a distribution of employment.

He contrasts unfavourably the development of beneficiary features in American trade unions with that of European trade unions, especially those of the United Kingdom, quoting the returns of the Chief Registrar for the year 1908. Later returns show a considerable decline in the amount expended by our 700 (or so) trade unions on unemployed, travelling, and emigration benefit, which was, in 1914, 885,362*l.*; in 1915, 294,520*l.*; and in 1916 only 120,164*l.* Unemployment benefit alone cost 1*s.* 9*d.* per member in 1915 and only 8*d.* in 1916. This decline, probably due to war conditions, does not materially affect the result.

Dr. Smelser's essay contains much useful and suggestive information. E.B.

13.—*A Monograph on Indian Railway Rates.* By S. C. Ghose. 595 pp. Calcutta: Superintendent of Government Printing, 1918.

Mr. Ghose's monograph is a mine of detailed information, and should prove of great value to those who are responsible for the working of railways in India. But the self-denying ordinance by which the author has limited himself to "plain statements of "facts" and has avoided "as far as possible any suggestions as "to future action," lessens its interest to the general reader. What that intelligent person would have liked to find would have been a comparison of Indian with English and American rates, and an enquiry how far the differences are justified by variations in the cost of construction, in working expenses, and in the average income of the class of people from which the bulk of the travelling public is drawn. A matter of even greater interest would have been the bearing of Indian experience on nationalization proposals. Fortunately, a certain amount of information on both questions can be extracted by an observant reader, and Mr. Ghose has not wholly refrained from pertinent criticisms.

The construction of railways was mainly carried out by private companies, aided by a Government guarantee of a minimum rate of interest. These companies received long leases, at the expiry of which the State was entitled to buy out the shareholders. Of a total mileage of 34,000 it now owns 26,000, but in most cases contracts for working the lines have been given to the former proprietors, who have been allowed to retain a considerable pecuniary interest in the results.

Any Government which allows private persons to undertake a business of the sort is bound in the interests of the public to exercise strict control. The Indian Government as guarantor had the further duty of protecting the taxpayer. From the first, therefore, it fixed maximum and minimum rates. But the difference between them was so wide that the companies were, in fact, left a very free hand. It is only necessary to refer to the third-class passenger and the two lowest classes of goods rates. These, with specially low rates for coal, cover all traffic of importance. Before 1917 the third-class passenger fare could not exceed $\frac{1}{4}$*d*. or fall below $\frac{1}{8}$*d*. per mile. The rates actually charged varied from one-sixth to one-fifth of a penny. This may be contrasted with the English pre-war statutory penny rate and the actual average English rate of four-fifths of a penny in 1903 quoted by Mr. Ghose. Roughly, the proportion is as 1 : 5, and, low as the Indian rate looks, it seems probable that the Indian traveller pays more, having regard to his income, than the English. The figures in Appendix V show that the traffic is sufficiently profitable, the average gain per unit per mile being about one-twelfth of a penny. In 1917 the maximum was raised by 33 per cent. in order to reduce travelling during the war. But the income continued to expand, and such reduction in the number of passengers as occurred may have been due to the running of fewer trains. Mr. Ghose thinks it may be well to revert to the old rates, at least in the case of long journeys, otherwise he fears the pilgrim traffic may be affected. Pilgrimages are an important source of revenue, playing the part occupied at home by excursions to the seaside.

In 1903 the Indian Government obtained from an English expert, Mr. T. Robertson, a report on its railway policy. According to his figures the goods rates for merchandise and minerals were respectively 28 and 37 per cent. of the corresponding English rates. Apparently in 1903 American were lower than Indian rates, and Mr. Robertson advised heavy reductions. The Government did not go as far as he suggested, but the pre-war rate for coal was 40 per cent., and that for wheat, oilseeds, and raw cotton 20 per cent. below those in force ten years earlier. The reduction has been justified by a steady rise of tonnage carried and of income. The wheat rate seems quite suitable, and any small change in it would have an insignificant effect on the price of Indian wheat in the English market as compared with that produced by the violent fluctuations of sea freight.

Mr. Ghose evidently thinks that the Government has sometimes failed to safeguard the interests of native producers. He quotes rates applied to oilseeds and raw cotton, which seem to give an artificial stimulus to exportation, for which there is no apparent justification. Probably Sir Thomas Holland's Committee has considered the matter.

Opponents of nationalization might find some arguments in Chapter VIII and Appendix IV, which deal with the economics of transportation. But, whatever defects may exist, it must be admitted that, broadly speaking, the policy of State railways has in India justified itself. Neither the employees nor the general public have been in a position to exercise such undue pressure on the Government as may imperil the success of nationalization in

England. In recent years the taxpayer has had no reason to complain. In the last quarter of the nineteenth century the expenditure and interest charges were not completely covered by the income. But in the six years ending 1917–18, according to the latest Railway Administration Report, the State lines earned on the average 5½ per cent. Contrary to our English experience, the war has not stopped the expansion of the income and the growth of profit, which in 1917–18 amounted to 6·8 per cent. Perhaps the success attained may be due in part to the extent to which the Indian Government has employed private companies as managers, even after they have ceased to be proprietors of anything but a fraction of the capital.

J.M.D.

14.—*Legislative Regulation of Railway Finance in England.* (University of Illinois Studies in the Social Sciences.) By Ching Chun Wang. University of Illinois, Urbana. Parts I and II. 196 pp., 8vo. 1918. Price $1·50.

The author of this interesting monograph rightly emphasizes the fact that the character of the legislative regulation of railway finance has been conditioned by the general freedom of English industry, the principle being well established that the State should interfere as little as possible with what was being or was capable of being performed by private enterprise. Until the passing of the Railway Companies (Accounts and Returns) Act of 1911 no general enactment affecting the framework of railway finances and accounts had been placed on the Statute book since the Railway Regulation Act of 1871, which, amongst other things, laid down the rules for the published accounts and returns which operated until after 1912. The years before 1871 may be divided into two periods—that between 1801 and 1844 covered the time during which the railway financial legislation was primarily directed to the prevention of bubble schemes by securing an efficient system of subscription contracts, and by requiring substantial deposits of money on each share subscribed. The legislation of the second period was concerned with the methods of regulating railway finance rather than the discovery of new principles, the main object being the restoration of public confidence, which had been rudely shaken by the financial expedients adopted by railway promoters in the preceding years, as described in detail in the monograph.

The author traces many of the irregularities which arose to the lack of a clear definition of what constituted working expenses prior to the passing of the Regulation of Railways Act, 1868, when effect was given to the far-sighted recommendations of the Select Committee of 1849 regarding the adoption of a uniform system of accounts, with schedules setting out the headings of working expenditure. Not the least valuable of the chapters is that devoted to the regulation of railway stock watering, an expedient which in principle has had few defenders, and is here shown not to have invariably operated in practice to the advantage of the shareholders.

Whilst Parliament has ever been concerned to leave unfettered the orderly progress of British railway enterprise, the view that the prosperity of the railway industry is in an especial sense a national concern is not one of recent growth, and although *The Times* newspaper can be found as late as 1886 saying that "the cost of a railway "is a matter with which the public and Parliament have no concern," that was probably not the view of the majority of its more thoughtful readers. The action taken by Parliament in 1867 in prohibiting the seizure of rolling stock revealed the advanced ideas of that body, and proved to be an effective measure for the establishment of stability in railway finance. It would be illuminating if the rise and development of the idea of railways as a national industry could be traced out, and the present monograph, whilst not pretending to so wide a scope, offers valuable data for such an investigation.

The legislature were obviously in 1868 fully alive to the incomplete character of the accounts schedules appended to the regulating Act of that year, and authorized the Board of Trade to improve these schedules, with the consent of the railway companies, from time to time. Judging by the evidence given before the departmental committee on railway accounts, 1909, the railway companies were also convinced of their inadequacy, and had drafted amended schedules. Eminent civil servants seem also to have appreciated the defects and lack of information contained in the published railway accounts and statistics, and it would be interesting to know whether this remarkable consensus of opinion was in any way connected with the missionary work of a number of statisticians and writers outside the official fold. In any case, for over thirty years the Board of Trade appears not to have moved officially in the matter, notwithstanding the great strides which had been made in American railway accounting and regulation, due to the measures of the Inter-State Commerce Commission. This is one of the several examples in which departmental conservatism has served to check the progressive character of English railway legislation.

Mr. Ching Chun Wang closes his book with the introduction of the Railway Companies (Accounts and Returns) Act, 1911, the principal features of which he describes, but recommends a detailed comparison of the different forms of accounts as set forth in 1868 (not 1886, as printed on page 174) and 1911. He makes the interesting suggestion that an annotated form of accounts showing the composition of every heading of receipt and expenditure should be promulgated under governmental authority for the information of the shareholders and the general public. It is obvious that with the different companies' accounts drawn up on a similar plan such a document must be a necessity to railway accountants, and is understood to have been prepared by a standing committee of accountants under the Railway Clearing House regulations. Its microscopical detail, however, would probably not be found so useful to the general public as headings of receipt and expenditure properly descriptive of their contents. As the author well points out, it is publicity that governmental regulation should emphasize, and in the long run the railways and all other parties concerned have much to gain and little to lose by adopting such a policy of publicity. We trust that Mr. Ch'ing Chun Wang may have time and opportunity for supplementing his valuable monograph by an account of the methods employed by the Government in preparing, checking and auditing the accounts of the different railway companies which have been since August, 1914, under State control.

W.H.J.

15. *The Economic Foundations of Reconstruction.* By Alfred Milnes. 221 pp., 8vo. London: Macdonald and Evans, 1919. Price 6s. 6*d*. net.

New Fallacies of Midas: a survey of industrial aad economic problems. By Cyril E. Robinson. With an Introduction by Sir George Paish. 289 pp., 8vo. London: Headley Bros., 1919. Price 6*s*. net.

Many books have lately been issued with the praiseworthy intention of educating the public in the elementary facts of economics. It is possible to hope that a demand has evoked the supply. At any rate, ample information is now at the disposal of the general reader, who is, incidentally, the general voter; and the two books here noticed are well fitted to give him an insight into the working of economic laws and some notion and the range of complexity of effect likely to ensue from a given economic policy. The two are, moreover, to some extent, complementary, for, while both offer instruction in elementary economics and touch on present problems, Mr. Robinson is more interested in the human, Professor Milnes in the material aspects. The first-named devotes the major portion of his book to the discussion of social and industrial questions, while the second is chiefly concerned with the application of economic principles to international trade, and, especially, with the justification they afford for the system of Free Exchange. The fact that the eight lectures which compose Professor Milnes' book were delivered by invitation of the Political and Economic Circle of the National Liberal Club, may, in some minds, work against the force of the logical arguments; but in any case he has contrived to impart, in a simple and even entertaining manner, some knowledge of the actual working of international commerce and exchange, as well as his opinions on the main questions of the day. The first three chapters deal respectively with Production and the Nature of Wealth; Exchange of Produce and International Trade; Money, in its various forms, and Foreign Exchange. This last section includes a very clear explanation of bills of exchange and their working, and is particularly commended to the attention of those who imagine that the effects of Free Trade or Protection begin and end with the profits of production. The reference to dumping, on p. 50, however, needs amendment. "Losing on every item but making their profit on "the quantity" suggests a commercial system even less remunerative than the classic practice of the Hebrideans. Professor Milnes goes on to discuss the possible and probable economic effect of the League of Nations, pointing out that economic pressure is unlikely to prove so simple of application or so effective in the result as has been easily assumed. Put briefly, the application will involve economic sacrifice, and where interests are not directly or greatly affected by the provocative act the tendency will be to prefer profit to principle. The proposal for a capital levy is next reviewed and condemned, without, however, any reference to the methods suggested by other writers for getting over the obvious disadvantages on which the author's objection is based. On the industrial question the line taken is that of insistence on more production as the main remedy for present evils, and in the light of this necessity, Professor Milnes discusses, among other things, the difficult problem of trade union practices. He advocates the formation of Whitley Councils and, in addition, of a Central Council to consolidate those of the separate industries, but no provision is suggested for safeguarding the consumer's interests in face of so gigantic a combination of producers. Nor, in his zeal for production, is there a hint that all things may not be equally desirable to produce.

Mr. Robinson, on the other hand, sees no prospect of satisfying Labour's desire for more enjoyment unless the whole community will consent to decrease its consumption, at any rate of superfluities. His view, in fact, embraces more than a purely material improvement, and his aim is to bring home to his readers the true meaning, in terms of human satisfaction, of wealth, capital, work, and value; the effect of monopoly; the position of Labour, with the issues involved in the industrial problem. He discusses at some length the various solutions offered by Socialists and Syndicalists of different schools; and, though his leanings are discoverable, he puts all sides of a case with fairness and careful lucidity, finding, indeed, grave disadvantages in each proposal, so that the reader is prepared in advance for the penultimate chapter, headed "Compromise." Mr. Robinson thinks that "the old rules of commerce must still stand, but must "be observed in a spirit of liberality and fair dealing," from which it will be gathered that he believes in gradual transformation rather than sudden reversal, and holds that any real improvement must depend upon individual standards of conduct, that is, upon moral rather than economic factors. Sir George Paish, in his able introduction, takes the same view, regarding it as axiomatic that "the "structure of society in each nation cannot be much in advance of "the mental and spiritual development of the average individual," and that "the economic possibilities of a nation in these days . . . "are governed not so much by its own natural resources as by the "mentality and character of its people." This book contains no statistics; there are scarcely half a dozen figures, but it is evidently based on the study of both facts and figures, is written with sincerity and charm, and should stimulate thought. C.T.

16. —*Charles Booth: a Memoir.* 176 pp., 8vo. London: Macmillan and Co., 1918. Price 5s. net.

This book is a fitting memorial of a long and strenuous life which exerted an increasing influence on the course of social and economic development for over thirty years. With the growing interest in social questions this interest has developed, and students of these problems constantly turn to the *Journals* of this Society, in whose pages the varied results of Mr. Booth's labours are recorded, and to the volumes of *Life and Labour* which form his enduring monument.

The memoir is arranged in six main sections, of which three trace the life history of Charles Booth and show the man in his home, social and business life. Other three relate to the subjects with which his name will ever be closely associated—life and labour, old age pensions and industrial policy. A brief concluding section affords a glimpse of the home at Gracedieu with which his later years were associated.

Born at Liverpool in 1840, Charles Booth grew up in an intellectual atmosphere. While not regarded as clever, he early showed the steady application, exact observation and constancy of purpose which in later years enabled him to complete the sixteen volumes of *Life and Labour*; these occupied nearly twenty years of his life. His one notable success in school life indicated the trend of his mind. To test the relative capacity of the scholars, the master of his school set a paper on arithmetic for the whole school, and Charles Booth, then in one of the middle forms, came out first. He began his business life with Mr. Lamport, of Lamport and Holts, subsequently joining his brother Alfred in business in America. In 1866 the brothers purchased two steamships, and this venture was the beginning of the Booth Steamship Company.

The problems of the poor were demanding attention in the seventies and eighties. The theories and practice of the C.O.S., the work of Miss Octavia Hill, of Toynbee Hall and other settlements, interested Mr. Booth, while the various and often contradictory remedies proposed for the social distress convinced him that a close study of the facts was the great need. To this investigation he devoted himself, regarding himself as an inquirer and recorder of facts.

The first work was a comparative statement of the occupations of the people of the United Kingdom, based on the Censuses of 1841–81, which was read before the Statistical Society in June, 1886. At this time he was already engaged on the East London inquiry, which was founded on the information in the possession of the School Board visitors. The results were published in 1889, the inquiry being subsequently extended to the whole of London and the basis widened by the inclusion of evidence from municipal workers, clergy and others acquainted with the lives of the people. The facts thus recorded aroused general interest and inspired similar investigations in other places, such as York, Dundee, West Ham, &c.

While Charles Booth's name will be generally associated with this

London enquiry, perhaps the most beneficial part of his work was his persistent advocacy of old age pensions. In November, 1891, he read a Paper on this subject before the Statistical Society, which aroused general opposition. However, he did not lose heart, but immediately published *Old Age Pensions: a Proposal*, stating his views and replying to his critics. *The Aged Poor* and other publications followed. The Government appointed a Commission on the Aged Poor, but this disagreed. In 1899 a Select Committee recommended pensions for the deserving poor, and in 1908 Mr. Booth had the satisfaction of seeing a Pensions Act passed, although not so wide in scope as his proposals.

Perhaps the most interesting parts of the volume are the early letters written to his brother Alfred, and the later letters to his wife. These reveal his power of carefully noting and blending vital facts and minor details to form a complete picture. This exact apprehension of essential details was one of the secrets of his success. The letters from Italy to his wife enable the reader to form a perfect picture of Italian peasant life, while his description of the houses in which he lodged at Liverpool and in East London enable the reader to take a place in these working-class homes.

The work has been well done. It is the tribute of a loving hand, and many who loved and admired Charles Booth thank the writer for this opportunity to renew their fellowship with a great and unselfish soul. G.E.A.

17.—*Report of the Department of Labour on the Conditions of Wage-Earners in the State of Connecticut.* By Charlotte Molyneux Holloway, Industrial Investigator. 144 pp. Published by the State, Hartford, Conn., U.S.A., 1918.

Weekly earnings of Women in Five Industries (*Paper Boxes, Shirts and Collars, Confectionery, Cigars and Tobacco, and Mercantile Establishments*). 21 pp. No. 92. February, 1919.

The Industrial Replacement of Men by Women in the State of New York. 68 pp. No. 93. March, 1919. Special Bulletins of the State of New York Department of Labour.

These three reports are samples of the flood of literature poured out by the Federal and State printing presses on behalf of the Bureaux of Labour in most of the four dozen States, as well as in the Federal District of Washington. They are interesting to English readers, not only because the conditions they describe are different from our own, but because the method of investigation and the style of the reports reveal even greater differences. This is especially marked in the report from Connecticut; for it by no means confines itself to describing all that concerns the workers while in the factory, and to making practical recommendations on matters within the jurisdiction of its department, but it discusses such questions as Americanization, the influenza epidemic, and the methods adopted by the British and French Governments to stimulate munition production; it criticizes policy, deals with ethical problems, and passes judgments on actions in a way which would make a British Blue Book blush purple. One cannot imagine a Government servant declaring roundly, "What capital and labour need is more "individual liberty, not action under centralized and remote "authority," or condemning a group of workers, because their only motive for working was the desire to make money, with the words, "Their attitude was openly and sordidly disgusting in this respect." In addition to the entertaining opinions and language of the investigator, great interest attaches to the description of the conditions of work and life in a state which furnished more than half the munitions and other materials of war provided by the United States in the Allied cause. The Report concludes with some workmanlike statistics concerning the nationality, age, and civil condition of the 372,000 workers, the value of the output, the number and wages of the employees in each industry.

The New York reports reveal a temper in investigation far nearer our own, but the details which it is possible to collect in a comparatively small and well-organized state are the envy of students of industrial conditions in the United Kingdom. They are well worth a perusal both for the interest of the information they contain and for method by which it is collected and presented. D.M.B.

18.—*Other New Publications.**

Brazil. Estimativa da Produccas do Milho no Brazil. (Safra de 1916–17.) 92 pp. la. 8vo. Rio de Janeiro, 1918.

[A pamphlet descriptive of the cultivation and production of maize in Brazil, and of its place in the economic development of the country. There are numerous tables and two diagrams.]

Brož (*Alexander*). The rise of the Czecho-Slovak Republic. 31 pp., 8vo. London: Twentieth Century Press, 1919. Price 3*d.*

[A short account of the formation of the Republic, its aims, area, population, and economic possibilities.]

Cannan (*Edwin*). Coal Nationalisation. Précis and Evidence offered to the Coal Industry Commission. 36 pp., 8vo. London: P. S. King and Son, Ltd., 1919.

Scott (*Leslie*), K.C., M.P. "A Leap in the Dark." Speech by Mr. Leslie Scott as Counsel for the Royalty Owners and the Mining Association of Great Britain before the Coal Industry Commission. 138 pp., 8vo. London: The Colliery Guardian Co., Ltd., 1919.

[Both publications, like that of Mr. Harold Cox, have apparently been issued with the object of calling attention to the dangers of nationalisation, but, as might be expected, the points of view differ considerably. Mr. Scott urges a "thorough investigation of the effect of nationalisation here or in other countries" to begin with, remarking that such evidence as already exists—*e.g.*, as to state railways or mines in Prussia, France, Australia and elsewhere, is not encouraging. In the meantime he considers it certain that the motive of personal gain is the only one powerful enough to secure efficiency and development, and, in enumerating the drawbacks of state management, he points especially to the danger of political corruption and to the evidence gained in war time

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* See also "Additions to Library," page 625, *sqq.*

Scott (Leslie), K.C., M.P. "A Leap in the Dark"—*Contd.*

of the incompetence, in a commercial sense, of public departments. Finally he asserts bureaucratic control to be impossible "because the miners won't have it," and that the real choice lies between control by the present owners and control by the miners. The scheme offered on behalf of the owners is that formulated by Lord Gainford, which includes supervision, with certain rights of interference, by a State Mining Department; joint councils of miners and owners on matters of "safety, production, efficiency and welfare"; a standard wage and a standard dividend, the balance of profit to be shared by employers and workers. The supporters of this scheme are against any form of unification on the grounds that in any undertaking "too large to be properly supervised by one board of management" a species of "departmentalism" becomes inevitable. The mine-owners are also strongly opposed to any form of joint control by the workers, as calculated to hinder efficiency. On the other hand, Professor Cannan's suggestions for reform (which, however, were only presented because some change had been already declared necessary by the Commission) include joint control by the miners, and he frankly contemplates the possibility of a gradual transition to what would in effect be a syndicalist system, believing a monopoly to be less dangerous in the hands of the workers than in any other hands. He sees, in fact, no reason why such a system should not answer if the transformation takes place naturally, in accordance with changing conditions, and not as a sudden revolution. Both papers deserve study, and those who like to hear all sides might concurrently read the articles on nationalisation by Mr. Emil Davies which recently appeared in the daily press.]

Commerce and Industry. A historical review of the Economic Conditions of the British Empire from the Peace of Paris in 1815 to the Declaration of War in 1914, based on Parliamentary Debates. Edited by William Page, F.S.A., with a Preface by Sir William Ashley, M.A., Ph.D. With separate volume of Tables of Statistics for the British Empire from 1815. Two vols., cr. 8vo. London: Constable and Co., Ltd., 1919. Price 56s. the two volumes.

[These volumes, received too late for review in the present Journal, have been compiled with a view to providing an impartial record of public opinion on British industrial and commercial life as shown by the debates of the Houses of Parliament during the past century. As is pointed out in the preface, such a method has certain defects as well as valuable qualities, and an endeavour has been made to overcome the former by using other sources of information where practicable. The volume of statistics is intended to cover the whole ground so far as these are available and they are almost entirely from official sources. The two volumes form a valuable book of reference for students of the period in question.]

France. Département de la Seine. La constitution de l'Office Départemental du Placement et de la Statistique du Travail de la Seine. Son action et ses travaux du 1er novembre, 1915, au 30 octobre, 1918. 432 pp., 4to. Paris, 1919.

[The Central Labour Exchange was established in Paris in 1915 and under its constitution it should have reported yearly, but this being impossible in the circumstances, this report deals with its operations during the first three years of its existence. It includes an account of employment agencies before the war and of their varying methods and defects. Details are given of the working of the present Department, and there are elaborate statistical tables of the numbers who have applied for work and of those who secured employment in their different trades.]

Hoffman (*Frederick L.*). The Failure of German Compulsory Health Insurance—a War Revelation. An address delivered at the Twelfth Annual Meeting of the Association of Life Insurance Presidents at New York. December 6, 1918. 21 pp., 8vo.

——— A Plan for a more effective Federal and State Health Administration. 87 pp., 8vo. Newark, N.J.: Prudential Press, 1919.

[The indictment of German social insurance is aimed at the principle of compulsory insurance as well as at the particular system employed in the country of its origin. Some of the drawbacks noted are perhaps less attributable to the principle than to German administrative methods and the tendencies they have fostered in the nation. It is also taking rather a heavy stick to beat the dog with to assert that "the German cause of world conquest [*sic*] was largely conditioned by the German conception of so-called social or compulsory insurance." But the whole contention is damaged by an exaggeration which goes the length of attributing all the arguments in favour of state insurance to German propaganda. More convincing objections to the present compulsory systems are really contained in the second publication, where, in framing recommendations for a complete scheme of health administration in his own country, Mr. Hoffman asserts that the national insurance systems of Great Britain and Germany fail in essential respects, since they hardly touch the treatment of serious disease and involve an undemocratic discrimination between classes. His plan for reorganisation in the United States is an effort at reform in the direction of adding to the restrictive and remedial measures with which legislation is now chiefly concerned, a positive care for the national health by attention to individual physique and welfare. As a means he would provide for (1) the physical and medical examination of at least children and young persons; (2) accurate and complete registration of at least all serious illnesses considered as a community problem; (3) establishment of a limited State medical service. A scheme for a departmental organisation is tentatively presented.]

India. Bureau of Education. Education in 1917–18. 87 pp., 4to. Calcutta, 1919. Price 12 annas, or 1*s*.

[The Bureau of Education issued last year an elaborate report on the development of education in India since 1911–12. The present report is a curtailed statement for 1917–18, the tables forming the most important part thereof, the letterpress being merely a commentary on the tables, and a statement of the outstanding features of the year.]

Insolera (*F.*). Sulla misura dell'aumento di mortalità per effetto indiretto della guerra. Roma, 1919. Reprinted from *Rivista di Sociologia*, 1918.

[A criticism of various methods suggested for the measurement of the indirect effects of war upon mortality. The author considers that of Hersch, objected to by Nixon and Gini, superior to those advocated by the last mentioned authors, which he strongly condemns. A writer who states that the equation $y^2 + x^2 - x = 0$, *i.e.*, that of a circle having its centre at $(\frac{1}{2}, 0)$, is that of a parabola with its vertex at $(\frac{1}{2}, \frac{1}{2})$, is hardly entitled to comment sarcastically upon the superiority of natural good sense to mathematical methods.]

Irving National Bank. Vol. IV, No. 5. Foreign Trade Thought of 1919. 85 pp., 8vo. New York.

[A summary of the Convention Committee's Report, and excerpts from addresses at the sixth National Foreign Trade Convention held at Chicago in April. The Convention's "theme" was "Foreign Trade Essential to American Industry," and the report declares that the "national need for expanded export trade to meet new conditions

Irving National Bank. Foreign Trade Thought of 1919—*Contd.*

abroad and to assist in stabilising industrial conditions at home" has been clearly shown. It was "recognised that serious difficulties would attend" the "effort to maintain and extend our foreign trade," and the Convention put forward definite recommendations for remedying the lack of "certain vital factors." The reforms urged concern chiefly shipping and shipbuilding, international parcel post, cables, aerial mails and the consular service.]

Marchetti (*Livio*). The Economic Revival of Italy. Translated by Magda Sindici. 91 pp., 8vo. Torino: Unione Tipografico-editrice Torinese, 1918.

[A résumé of Italy's progress from her unification to the present day. The figures of the working population, of agricultural, industrial and mineral production and development are given in some detail and contrasted with the conditions in the period of Austrian occupation. In the chapter called "Commercial Currents" the extent of Germany's commercial penetration is indicated by the export and import tables, and its method briefly exposed in the text. The last chapter deals with Italian finance. The illustrations consist of diagrams, cartograms and pictorial representations of the relative stages of development. It is altogether a useful little handbook.]

Maroi (*Lanfranco*). La Proprietà Terriera e il Debito Ipotecario. 34 pp., 8vo. Roma: Tipografia dell' Unione Editrice. 1918.

[An examination of the mortgage debt in Italy and of the conclusions which may be drawn from the results thereof as to the agricultural progress of the country. It is sought to show that the agricultural prosperity of a country does not necessarily move inversely as the amount of its mortgage debt, but that this must be analysed in various ways in order to arrive at a just estimate of the situation. The debt is here classified according to magnitude of the amounts, rate of interest, the nature of the property, the species of loan, the class of creditor (individuals, banks, agricultural societies, &c.), and the proportions of the total and of different classes held in the various regions and provinces are shown in tables, the figures of 1910 and 1903 being contrasted. The conclusion arrived at by Professor Maroi is that the value of Italian lands is steadily being developed. and that the good progress which has evidently been made during the period under examination should be greatly increased as agricultural credit becomes more systematised and more soil is thereby brought into better cultivation.]

Modern Morocco. A report on Trade Prospects, with some Geographical and Historical Notes. Compiled by Walter B. Harris and the Hon. W. Cozens-Hardy, K.C., M.P., for the Bank of British West Africa, Ltd. 267 pp., 8vo.

[The object of this book is to call the attention of British organisers to the opportunity offered by Morocco at the present time. The French occupation has effected a reconstruction of the country which makes possible the orderly development of its great possibilities. Morocco is agriculturally rich, with an excellent climate, and has "a possible great future in minerals"; it is easily accessible, and the transport facilities, harbours, &c., are now being rapidly developed. "There is every reason to believe that British capital, British trade and British enterprise will be welcomed by the Protectorate authorities." This is the gist of the preface. The book itself gives a minute account of the country—its physical features, population, history, treaties, ports, irrigation, roads and railways; statistics of export and import, revenues, manufactures, agriculture, fisheries and mining. It consists almost entirely of statements of fact and of figures, but contrives not to appear in the least dull, partly because of its very conciseness, partly from the intrinsic attractiveness of much of the detail. For instance, *Modern Morocco.* A report on Trade Prospects—*Contd.*

under "Details of Imports" we are told what particular patterns of tea-cups, candles, bowls and bedsteads the Moors prefer, and that woollens should be of pink, green, red, blue or claret; and, elsewhere, that at present "Moorish slippers are almost the only manufactured article exported." A very interesting chapter is devoted to the analysis of German pre-war trade; another, entitled "Practical Hints," gives particulars of the cost of living, hire of labour, &c., in Morocco to-day. Finally, there is a good index.]

Rowntree (*Joseph*) and *Sherwell* (*Arthur*). State Purchase of the Liquor Trade. 87 pp., 8vo. London: George Allen and Unwin, Ltd., 1919. Price 1*s.* net.

[The authors base their arguments mainly on the impossibility of achieving any real reform of the drink trade while control remains in the hands of those who profit by the manifest abuses. They remind us that the only war regulations not readily accepted were those affecting the manufacture and sale of alcohol, which were obstinately fought by the trade, and also recall the well-known fact that the war restrictions ultimately imposed, though they limited consumption and materially decreased drunkenness, were most unsatisfactory on the economic side. The expenditure on alcohol rose, in fact, from £166–7 millions in 1913 to £259 millions in 1917, notwithstanding a 50 per cent. decrease in consumption, and the profits of brewery companies reached record heights, the increased taxation being transferred to the consumer. It is strongly urged that control by the State is the only effective remedy for this state of things, and the advocates of this policy can point, as Mr. Rowntree and Mr. Sherwell do, to the signal success of the Carlisle experiment, which showed how reforms in the public house system may be effected with both economic and moral advantage. Although the efficacy of a local experiment does not guarantee success when applied on a national scale, a study of the results obtained will lead to the conclusion that, in this instance, there is much to hope for in a policy of State purchase.]

Said-Ruete (*Rudolph*). Politische Korrespondenzen und Friedfertige Kriegsaufsätze, 1914–18. 193 pp., 8vo. Zurich: Art. Institut Orell Füssli, 1919. Price 10 francs.

Tittoni (*Tommaso*). Conflitti Politici e Reforme Costituzionali. 271 pp., 8vo. Bari: G. Laterza and Figli. 1919. Price 7 lire 50 c.

[This study by the eminent Italian statesman consists of three parts. The first deals with the relations of the Italian Parliament with the Government during the war and criticises the policy of the latter with regard to the peace terms as they affect Italy. The second part is an elaborate study of the relations between the British Houses of Parliament and of the financial privileges of the House of Commons. The final portion of the book deals with methods of election and includes a description of the working of proportional representation, of the "Scrutin de liste," and of their effectiveness as representing fairly or otherwise the opinions of the majority of the electors.]

U.S.A. Bureau of Education, Bulletin No. 9, *Education in Great Britain and Ireland.* 139 pp., 8vo. Washington, 1919.

[A review of the developments of education in England and Wales during the past few years and of the influences of the war on education generally, as far as they can at present be traced. University education, the education of women and technical education have all been affected by the war and the main results are outlined in the report. Among other subjects discussed are medical inspection of schools, education of working boys and girls, salaries and pensions of teachers and the Education Act of 1918. Shorter accounts are also given of educational conditions in Scotland and Ireland.]

CURRENT NOTES.

The trade returns for June, though showing some reduction in the value of the imports and a maintenance of exports at the improved position reached in May, continue to represent a situation which is far from satisfactory. With imports valued at roughly double those of the period immediately preceding the war, exports show an aggregate increase by only about one-half. The excess of imports over exports in June was 46,400,000*l*., and if this average were maintained for a twelvemonth the excess would amount to over 550,000,000*l*., or four times the excess of the twelvemonth preceding the outbreak of war. Our summary given below shows that, for the year ended at June 30 last, an excess of 726,000,000*l*. was recorded, so that the balance of June shows some improvement, serious as it is in itself. The inflation of prices makes a direct comparison of current figures with corresponding pre-war records somewhat difficult, and the volume of the import trade is probably not greater than before the war, in spite of the great increase (80 per cent.) in its value, while the volume of exports is almost certainly less.

The tonnage of shipping visiting our ports to bring or take civilian cargoes is showing some recovery, though it remains on a scale but little over one-half of the pre-war scale.

The values of the principal classes of merchandise imported and exported in the twelve months ending June, 1919 and 1918, respectively, were as follows :—

	Twelve months ending June, 1919.	Twelve months ending June, 1918.	Increase (+) or Decrease (−).
Imports, value c.i.f.—	£'000	£'000.	£'000.
I. Food, drink and tobacco	601,903,	505,876,	+ 96,027,
II Raw materials and articles mainly unmanufactured	509,692,	427,051,	+ 82,641,
III. Articles wholly or mainly manufactured	265,732,	275,819,	− 10,087,
IV. Miscellaneous and unclassified (including parcel post)	6,804,	7,205,	− 401,
Total merchandise	1,384,131,	1,215,951,	+ 168,180,

	Twelve months ending June, 1919.	Twelve months ending June, 1918.	Increase (+) or decrease (−).
	£'000.	£'000.	£'000.
Exports of produce and manufacture of the United Kingdom, value f.o.b.—			
I. Food, drink and tobacco	19,299,	13,057,	+ 6,242,
II. Raw materials and articles mainly unmanufactured	79,869,	61,835,	+ 18,034,
III. Articles wholly or mainly manufactured..........	469,973,	427,810,	+ 42,163,
IV. Miscellaneous and unclassified (including parcel post)	17,255,	20,063,	− 2,808,
Exports of foreign and colonial merchandise, value f.o.b.			
I. Food, drink and tobacco	19,545,	4,239,	+ 15,306,
II. Raw materials and articles mainly unmanufactured	33,145,	21,509,	+ 11,636,
III Articles wholly or mainly manufactured....................	16,906,	14,410,	+ 2 496,
IV Miscellaneous and unclassified	17,	51,	− 34,
Total British, foreign and colonial	656,009,	562,974,	+ 93,035,
Shipping—	Tons net. '000.	Tons net. '000.	Tons net. '000.
Total, British and foreign, *entered* with cargoes	24,600,	22,747,	+ 1,853,
Total, British and foreign, *cleared* with cargoes	27,993,	24,589,	+ 3,404,

In continuation of statistics relating to employment within the United Kingdom, quoted on page 422 of the May JOURNAL, further returns from trade unions with a net membership of 1,338,000, excluding those serving with the Forces, showed 2·1 per cent. of their members as unemployed at the end of May, as compared with 2·7 per cent. at the end of April, and 0·9 per cent. a year before. Similar evidence showing a decrease in the large amount of transitional unemployment prevalent in recent months is afforded by the statistics relating to the payment of out-of-work donations. The number of policies remaining lodged at employment exchanges fell from 1,093,328 at April 25 to 771,211 at May 30. Of those held by civilians, the figures for men between the same two dates showed a reduction from 215,687 to 150,250, those for boys a reduction from 23,679 to 12,912, and the decreases in the case of women, from 443,941 to 207,897, and in the case of girls, from 28,964 to 13,231 were still more marked, making the total fall for civilians one from 712,271 to 384,290. Against these decreases have to be set slight increases in the case of demobilized members of

H.M. Forces, viz., from 379,799 to 384,919 for men, and from 1,258 to 2,002 for women. The reduction in the total, however, even when allowance is made for the exclusion of policies of persons working short time, and for the closer scrutiny of claims, indicates a substantial improvement in the state of unemployment. Returns received from employers show, for the industries covered, an increase between May 3 and May 24 of 2·4 per cent. in the numbers employed, and an increase of 6·6 per cent. in the wages paid.

Week ending	Textile trades. Percentage change on a year ago.		All trades covered by the returns. Percentage change on a year ago.	
	Numbers employed.	Wages paid.	Numbers employed.	Wages paid.
May 3	−2·1	+28·0	+2·4	+29·2
May 24	+1·9	+36·2	+5·9	+36·4

German trade union returns, covering 3,052,000 members, showed 5·5 per cent. as unemployed at the end of April, as compared with 3·9 per cent. in the preceding month, and with 0·8 per cent. in April, 1918. The number of unemployed entitled to out-of-work pay decreased from 1,053,854 to 829,758 during April, but this decrease is principally due to the movement of unemployed industrial workers into the country, and also to the stricter control of the payment of benefit, and it does not therefore follow that any considerable improvement took place in the labour market. In Holland the percentage of unemployed in all the unions making returns rose still further from 14·9 per cent. in December to 15·9 per cent. in January, as compared with 13·5 per cent. in January, 1918. Quarterly returns received from Canadian trade unions, representing over 85 per cent. of the total trade union membership of the country, give 5·62 per cent. as unemployed at the end of March, as compared with 2·76 per cent. in December, 1918, and 1·68 per cent. in March, 1918. The *Monthly Labour Review* of the United States shows a general decrease of the numbers employed, particularly in the woollen trade, where there was a decrease of 42·1 per cent. in February as compared with January, and a decrease of 59·7 per cent. as compared with a year before. The only industries showing a slight improvement were automobile manufacturing, men's ready-made clothing, and leather manufacturing.

The average rise of retail food prices in the United Kingdom since July, 1914, which stood at 107 per cent. on May 1, fell further to 104 per cent. on June 2. The decrease was mainly due to a reduction of *2d.* per lb. in the price of imported beef and mutton, and to a fall in the price of fish of about 10 per cent. on the prices of May 1. On the other hand, margarine rose by *2d.* per lb. and potatoes showed a seasonal increase. There was no appreciable change in the other principal articles of food.

After allowances for changes in consumption, as estimated by the Ministry of Food, the estimated increase in "expenditure" upon food, which was put at 81 per cent. on May 1, rose to 87 per cent. on June 2. As to other items than food in the family budget, clothing in particular has shown a very great increase, and if changes in "expenditure" upon food be combined with the average increase in the retail prices of other items (including rents), the resultant increase on June 2 was 95 per cent., as compared with 90 per cent. on May 1.

In Canada, the level of food prices, which had been falling slightly since December, showed in April an increase of 2·3 per cent. on March, making a total increase of 79·9 per cent. since July, 1914. The corresponding increase in the total expenditure on food, fuel, lighting and rent was 1·7 per cent. in the month, and 50·7 per cent. as compared with July, 1914. The rise of the retail prices of articles entering family expenditure in South Africa also continued, reaching on the pre-war basis 41 per cent. in Capetown and 36 per cent. for the Union as a whole. On the other hand, in New Zealand, the slight reduction of retail food prices since December, 1918, was carried further, the fall between January and February amounting to 2 per cent., and leaving the total increase in the latter month since July, 1914, at 42·2 per cent.

In the United States, retail food prices rose 4 per cent. between the middle of March and the middle of April, the total increase at the latter date being 78 per cent. on those of April, 1913. The general level of retail prices of food in French towns with over 10,000 inhabitants (excluding Paris) during the first quarter of 1919 showed a rise of 6·6 per cent. as compared with the last quarter of 1918, and of 176·9 per cent. as compared with the third quarter of 1914, while in Paris retail food prices for March marked an advance of 9·7 per cent. on those for February, or a total increase of 148·4 per cent. on July, 1914. The general level of food prices in Rome showed a decrease of 5·5 per cent. in March, 1919, as compared with the preceding month, but still remained 143·3 per cent. above the level of the first half of 1914; if the prices of other household necessaries be included, the increase on the pre-war level was 127 per cent. In Milan, in April, the increase in food prices and in general expenditure were 263 per cent. and 231 per cent. respectively, or, if account be taken of changes in consumption, the increases were 146 per cent. and 158 per cent. respectively. In Amsterdam, food prices for a working-class family in February showed an increase of 9·2 per cent. on January, or a total increase of 106·9 per cent. on the level of 1913.

As regards wholesale prices in the United Kingdom, the *Statist* index number rose from 184·6 at the end of April to 194·6 at the end of May, as compared with 82·4 for July, 1914. Part of this increase was anticipated in the *Economist* index number for the end of April, but the further rise shown by this index was still considerable, namely, from 262·4 to 272·2. The increases have been largely coincident with the removal of measures of control as regards price and foreign trade. In the *Economist* index number, the group of foodstuffs showed little change, but textiles showed an increase of 82 per cent., mostly in cotton and wool; minerals, after the remarkable increase for April, especially in iron, showed a further increase of 2 per cent.; and in the miscellaneous group, the outstanding feature was the sharp rise in oilseeds, following the removal of control.

The third part of the supplement to the 75th Annual Report of the Registrar-General (Cd. 8002) contains the customary analysis of the vital statistics of England and Wales for the previous decennium. The abstracts of the registration districts are similar in form to those of earlier reports, but the list of causes of death has been extended and sex mortality is tabulated in detail. Dr. Stevenson's general review is documented with many tables which are useful novelties, such as the standardised fertility rates computed by the method first communicated to the Society by Sir Arthur Newsholme and Dr. Stevenson. The most striking features of the vital statistics of 1901–10 are the great decline of infant and child mortality (the deaths under 1, per 1,000 births, fell from 153 in 1891–1900 to 128 in 1901–10), the continued decline of mortality from tuberculosis, and the continued increase of mortality from cancer and from diabetes. The standardised death rate at all ages fell to 16·6 for males and 13·9 for females, a greater reduction, both absolutely and relatively, than in any previous decennium. The improvement has been greater for women than for men, and Dr. Stevenson provides many tables showing the relative variations of sex mortality in different decennia. Equality of mortality between the sexes at ages 35–45 in 1841–50 has become a male excess of 22 per cent., a female excess of 6 per cent. at ages 25–35 has become a male excess of 17 per cent. An important but not the only factor has been the faster rate of decline in mortality from tuberculosis amongst women. The rate of natural increase in 1901–10 was slightly greater than in 1891–1900, the increasing decline of the birth rate being more than compensated by the still greater decline of the death rate. But as Dr. Stevenson notes, this credit balance has since been converted into a deficit; even before the war the effect of the declining birth rate outstripped that of the lessening death rate. The Registrar-General's decennial supplements are among the sacred books of the vital statistician; the latest revelation is of even greater value than those which came before, and no higher praise can be given to a statistical report.

The reasons why birth registration is still very imperfect in the United States, even in the areas where it is enjoined by law, are illustrated by a recent leaflet (miscellaneous series No. 12) of the *Children's Bureau.* There appears to be a lack of means of enforcing compliance with the law, so that in order to secure registration it is necessary to educate each community as to its advantages. The leaflet therefore describes a scheme for a house-to-house canvass, designed to ascertain the proportion of infants born within the preceding twelve months who have been registered, and to be followed up by various methods of propaganda, public meetings, newspaper articles and the like. Such canvasses have revealed that in many communities supposedly within the birth registration area, numbers of births escape record. This area now includes twenty states and a little over half the population of the country, but as may be gathered from the above the standard of admission is not high, any state being admitted where a test shows over 90 per cent. of births to be registered, and where the law adopted gives promise of further improvement. The first report on birth registration in this area was recently issued by the Bureau of the Census. The advantages of birth registration (1) in providing proof of identity and age, (2) in supplying information required for administrative purposes, particularly child welfare work, and (3) for the purposes of vital statistics, are well put in the leaflet. It seems strange that in such a country as the United States these advantages should still be so widely ignored, and that the department of government concerned should have to plead in this way for compliance with so simple and so evidently beneficial a law.

Some interesting and important results in the mathematical theory of probability are obtained by Dr. Messina in vol. lvi of the *Giornale di Matematiche di Battaglini.* Suppose that an event has a *constant* probability p of happening in any one trial, then in n trials the event may occur 0, 1, 2, . . . or n times ; some of these frequencies are, of course, more probable than others, but Dr. Messina is not concerned with that. He inquires what is the probability that in a given series of n trials the number of successes should differ from pn by less than a specified amount, and further, what is the probability that the number of successes in n trials, $n + 1$ trials, . . . down to $n + m$ trials should differ from $p\,(n + 1)$, $p\,(n + 2)$, . . ., $p\,(n + m)$ by less than specified amounts. The specified amounts in the latter case being either all the same or forming a decreasing sequence. The problem has so far not been solved exactly, although its importance to statisticians is patent.

Inferior limits to the value of the probability have been given by authors cited by Dr. Messina, notably Cantelli. In the present paper Dr. Messina basing himself on a well-known theorem due to Boole and some recent work of De la Vallée-Poussin, obtains much higher values for the required lower limit of the probability. A numerical example will serve to illustrate the use to which Dr. Messina's formulæ can be put : in 200 *or more* successive tosses of a coin the probability that " heads " should appear not less than 50 and not more than 150 times in the first 200 throws, and in general not less than $\frac{n}{4}$ and not more than $\frac{3n}{4}$ times in n successive throws (n greater than 200) is *at least* 0·99969. The limits in this example are wide ; as may be expected, a high probability will be obtained with narrower limits only on condition that we have a large number of trials. Thus, in 150,000 trials *or more* the number of " heads " in the toss of a coin will lie between 99 per cent. and 101 per cent. of half the throws with a probability of at least 0·99979. The paper will repay careful perusal and would be easier to read if the author had not used the word frequency (*frequenza*) in a sense quite contrary to accepted usage.

Of more doubtful value is the attempt by Dr. Guldberg in the *Comptes Rendus* for January, 1919, to prove Bravais' law for the frequency distribution of two correlated variables by Bachelier's method of continuous probability.

Dr. Guldberg denotes by $\omega\,(n - du, x - u, y - v)\,dxdy$ the probability that at the $(n - du)^{\text{th}}$ observation the errors in x and y should lie between $x - u$ and $x - u + dx$, and between $y - v$ and $y - v + dy$. He then denotes by $\zeta\,(n, u, v)\,du\,dv$ the probability that these errors should augment by u and v at the n^{th} observation. This leads to the correct equation—

$$\omega\,(n, x, y) = \iint \omega\,(n - dn, x - u, y - v)\,\zeta\,(n, u, v)\,du\,dv.$$

the function $\omega(n - du, r - u, y - v)$ is now expanded by Taylor's theorem and by neglecting *squares of* du *and cubes of* u *and* v, Bravais' formula is obtained, but Dr. Guldberg gives no reasons for neglecting terms of one order rather than another.

Die Bevölkerungsbewegung im Weltkriege, by C. Döring (I. Deutschland, Kopenhagen, 1919), is number 4 in the series *Bulletin der Studiengesellschaft für sociale Folgen des Krieges,* and deals with the positive and negative losses in population sustained by Germany during the war. Mr. Döring's main source of information is the weekly publication of the Imperial German Ministry of Health, supplemented by a few official statistical publications of one or two of the individual states, reports of trade unions, &c., and newspaper articles. The figures relating to births and deaths are to a great extent identical with those given by Sir Bernard Mallet in his presidential address to this Society, carried down to a later date, and the conclusions arrived at are quite in accord with those of our ex-president. Briefly summarised these are (1) Germany suffered a total loss by decline of births and excess of deaths of 5,600,000, and the total population fell from 67·8 millions to 65·1, of whom 33·9 millions are females and 31·2 males ; (2) of this loss 3·5 millions were by decline of births and 2·1 by excess of deaths ; (3) the ratio of females to males rose from 1,024 to 1,086, while, in the age group 20–50, the ratio rose to 1,155 ; (4) the children born from May, 1915, to July, 1919, were from one-third to one-half less than the normal ; (5) the males of military age fell from 14 millions to 12·2 millions, or by 13 per cent. by war losses alone ; (6) the excess of deaths in the civil population over 1 year of age was over 700,000 ; (7) owing to the enormous loss of males of procreative age the births will be at least 20 per cent. below the pre-war figures for a long time to come, while the deaths will be in excess, owing to the deterioration in the health of a large proportion of the population.

The total figures arrived at by Mr. Döring are in a considerable degree inferential, but they will probably prove to be approximately correct. We are however of opinion that he has taken an exaggerated view of the immediate effects of underfeeding on the increased mortality of Germany during the last two years. It was the obvious policy of German publicists to put these at their maximum and a little more, and our author seems to have taken their statements at their face value. Apart from this, his brochure is a very sober and sound review of the facts so far as they have been available to him, and no one who has studied the subject will be disposed to disagree with his main conclusions. He has supplemented our own figures in several particulars, notably as to marriages in 1915, when they numbered only 278,208 as against 513,283 in 1913, a fall of 45·8 per cent. It is interesting also to learn that of the 33,000 medical men in Germany 19,500 were at the front at the beginning of 1917, while another 5,000 were in military service at home, and that the numbers of swine fell from 25·3 millions at the end of 1914 to 12·8 millions in June, 1917.

A further work dealing with the former dual monarchy of Austria-Hungary is nearly completed, while studies of the movements of population in France and England are in course of preparation.

In the JOURNAL for July, 1914, we gave a series of tables reviewing the progress of the foreign trade of the United Kingdom for the ten preceding years. In the tables which follow, that review is continued through the period of the war, the figures for 1913 being repeated both for convenience of comparison and in order to present the results of the usual revision to which the preliminary figures are subject. The interpretation of the figures for the war period presents many difficulties, both because of the changes in price-levels and because of the changes in the nature of the goods imported and exported consequent on adjusting our trade to war conditions. That we sacrificed the greater part of our re-export trade in the course of that adjustment is readily seen from the tables, while the promptitude with which that branch of trade revived after the armistice of November 11 last is a striking feature of the record. That our already inflated import trade showed still further increases is also true, while the record of exports of British and Irish produce and manufactures bears witness that our industry and trade have not been wholly paralysed in spite of the depressing signs to which public attention has been directed in many industries.

In considering the tables which follow, it is necessary to bear in mind that, previous to July, 1917, the records did not include certain merchandise, other than food, which was, at the time of import or export, in public ownership, while these goods were included from that date. The Board of Trade Returns for December last contains a summary of the values of such goods so included in and after July, 1917.

IMPORTS.

CLASS I.—*Food, Drink and Tobacco.*

(000 £'s.)

	1913.	1914.	1915.	1916.	1917.	1918.	1919.
January	22,144	23,735	30,944	34,632	37,308	31,075	54,740
February....	20,720	20,933	27,984	28,241	31,614	36,079	45,015
March	21,981	23,860	31,383	36,381	37,077	44,300	47,926
April	23,741	23,351	29,896	32.361	43,310	59,561	52,972
May	23,278	21,946	30,018	38,062	45,354	70,211	62,844
June	34,362	23,058	33,328	38,718	46,796	51,269	59,046
July	26,355	24,224	36,775	31,742	48,736	47,809	—
August	32,529	21,478	32,751	31,467	41,227	50,044	—
September	25,060	22,932	33,022	36,677	32,938	43,624	—
October	27,359	27,871	30,945	37,269	32,154	47,759	—
November	25,734	30,954	33,054	40,261	33,163	43,201	—
December	26,459	34,120	33,011	34,600	27,039	49,088	—
Corrected total for year	290,202	296,969	380,875	419,167	454,711	572,660	—

CLASS II.—*Raw materials and articles mainly unmanufactured.*

	1913.	1914.	1915.	1916.	1917.	1918.	1919.
January	32,222	28,079	23,181	24,231	37,715	42,090	51,769
February....	27,181	24,548	24,318	24,675	27,841	42,860	42,346
March	22,429	24,854	29,846	32,220	29,588	40,781	37,080
April	22,008	22,460	28,431	26,289	28,038	34,641	42,356
May	21,400	20,335	26,181	26,738	29,479	30,669	53,297
June	18,494	19,107	26,427	30,324	28,705	32,576	47,602
July	18,633	18,646	21,903	28,775	27,771	34,658	—
August	16,760	13,933	20,157	27,793	35,228	36,023	—
September	19,920	14,403	19.921	25,753	29,265	29,938	—
October	27,042	13,761	22,143	28,704	36,998	40,318	—
November	27,335	15,044	22,640	33,893	43,574	49,017	—
December	28,499	21,301	21,562	27,591	31,172	45,286	—
Corrected total for year	281,822	236,531	286,570	336,792	384,798	458,859	—

CLASS III.—*Articles wholly or mainly manufactured.*

	1913.	1914.	1915.	1916.	1917.	1918.	1919.
January	16,565	15,685	12,776	15,813	15,341	24,408	27,160
February....	15,600	16,300	12,718	13.930	10,913	19,704	19,368
March	16,709	18,011	13,968	17,065	14,230	21,925	20,577
April	16,975	16,592	15.041	16.892	12.177	24,777	16,380
May	16,364	16,579	15,147	18.277	12.504	24,484	18,828
June	15,203	15.876	16,018	17,706	10,350	17,472	16,027
July	16,555	16,292	16,745	16,099	13,152	26,149	—
August	15,462	6,753	16,225	16,456	23,617	23,890	—
September	16,134	7,583	17,011	14,766	23,536	23,514	—
October	17,050	9,609	14.537	14,876	24,336	29,308	—
November	15,145	9,393	15,741	14,472	32,134	23,629	—
December	15,844	11.705	15.588	12,921	26,193	20,904	—
Corrected total for year	193,602	160,490	181,450	189.194	218,565	280.164	—

NOTE.—In and after July, 1917, the records include, but before that date they exclude, the values of certain goods (other than food) which were, at the time of importation, the property of His Majesty's Government or the Governments of the Allies, and goods exported which were taken from British Government Stores, or were bought by His Majesty's Government and shipped on Government vessels.

RE-EXPORTS.

CLASS I.—*Food, drink and tobacco.*

(000 £'s.)

	1913.	1914.	1915.	1916.	1917.	1918.	1919.
January	1,401	1,437	2.336	1,823	1.417	264	1,544
February....	1,180	1,324	1,761	1,740	1,185	362	1,395
March	1,266	1,439	1,913	2,028	686	211	3,089
April	1,306	1,406	2,293	1,702	411	188	5,168
May	1,395	1,607	2,286	2,280	389	231	2,854
June	1,321	1,441	2,071	1,973	597	229	2,949
July	1,212	1,386	1.796	1,748	671	185	—
August	1,200	585	1,359	1,683	453	194	—
September	1,182	1,251	1,441	1,840	370	232	—
October	1,592	1.746	1,533	1,789	399	255	—
November	1,476	1,919	1,938	1,245	500	692	—
December	1,411	1,905	1,657	1,212	420	987	—
Corrected total for year	15,943	17,442	22,399	21,077	7,439	4,030	—

CLASS II.—*Raw materials and articles mainly unmanufactured.*

	1913.	1914.	1915.	1916.	1917.	1918.	1919.
January	6,296	5,588	2,950	5,102	4,800	1,575	1,800
February....	7,016	6,340	3,193	4,739	5,727	1,363	1,939
March	5,998	5,732	4,471	4,557	5,061	1,605	3,804
April	6,399	7,305	6,082	4,319	6,358	1,010	6,468
May	5,599	6.360	5,989	5,772	4,450	2.136	6,755
June	4,705	5,182	5,540	4,692	4.237	1,079	6,820
July	4.477	3,980	5,385	3,597	2,541	786	—
August	4,592	2,683	4,082	3,561	2,684	939	—
September	3,123	2,344	4,131	2,905	1,650	642	—
October	5,541	3,502	3,918	3,291	2,199	842	—
November	4,363	2,374	4,619	3,766	2,034	1,208	—
December	5,947	2,479	4,213	2,847	1,510	1,141	—
Corrected total for year	64,038	53,858	54,588	49,137	43,374	14,325	—

CLASS III.—*Articles wholly or mainly manufactured.*

	1913.	1914.	1915.	1916.	1917.	1918.	1919.
January	2,998	2,557	1,608	1,903	2,209	1,351	1,214
February....	2,546	2,560	1,851	2,049	2,074	1,015	1,782
March	2,365	2,360	1,681	2.224	1,819	1,366	2,054
April	2,341	2,077	1,572	2,058	1,709	942	1.709
May	2,373	2,402	1,966	2.909	1,493	1.033	1.885
June	2,507	2,117	1,738	2,206	1,594	807	2.191
July	2,616	2,452	2,216	2,545	1,350	1,051	—
August	2,347	1.135	1.878	2,473	1.393	1,141	—
September	2,507	1,678	1,983	2.374	1.133	855	—
October	2,412	1,930	1,705	2.581	1,496	1,021	—
November	2,146	1,342	1,754	2,101	1.214	1,017	—
December	2,363	1,481	1,829	1,957	1,242	984	—
Corrected total for year	29,458	24,089	22,017	27,248	18,794	12,585	—

EXPORTS (UNITED KINGDOM PRODUCE).

CLASS I.—*Food, drink and tobacco.*

(000 £'s.)

	1913.	1914.	1915.	1916.	1917.	1918.	1919.
January	2,274	2,109	2,023	2,257	1,894	1,256	1,347
February....	2,093	2,339	1,835	2,199	1,644	869	1,248
March	2,117	2,426	2,089	2,446	2,025	824	1,824
April	2.290	2.304	1,999	2,543	1,370	1,006	2,835
May	2,306	2,333	2,138	2,626	1,164	1,106	3,222
June	2,413	2.600	2,166	2,605	1,130	891	2,707
July	2,763	2,716	2,077	2,790	1,210	952	—
August	2,835	1,532	2,099	2,716	1,304	954	—
September	3,189	2,137	2.168	2,659	1,181	962	—
October	3,275	2,217	1,869	2,537	1,226	987	—
November	3,943	2,036	2.194	2,174	1,138	1,180	—
December	3,110	1,893	2.340	1,943	1,091	1,079	—
Corrected total for year	32,588	26,949	25,082	29,495	16,332	12,067	—

CLASS II.—*Raw materials and articles mainly unmanufactured.*

January	5,809	6,002	3,440	4,625	5,954	5,370	5,162
February....	5,222	5,673	3,568	4,885	4,875	4,809	6.120
March	5,314	5,857	4,343	4,628	5,477	4,624	8,606
April	6,079	5.268	4,755	4,666	4,977	4,715	7,066
May	5,753	5,944	4,713	6,033	6,336	5,044	10,461
June	5,760	5,414	4,433	5,884	6,465	4,196	10,374
July	6,400	6,167	4,244	5,854	6,032	5,307	—
August	5,367	2,874	4.436	6,043	5,955	6,423	—
September	5.767	3.513	4.722	5,749	5,720	5,435	—
October	6,447	3,711	4,672	5,960	5,796	5,862	—
November	5,859	2,971	4,469	5,385	5,297	4,772	—
December	6,120	3,318	4,560	4,631	4,483	4,281	—
Corrected total for year	69,905	56,713	52,354	64,345	67,162	60,838	—

CLASS III.—*Articles wholly or mainly manufactured.*

January	36,600	38,564	21,732	27,410	36,593	33.588	39,888
February....	32,144	32,451	19,975	28,104	29,414	31,695	38,662
March	33,368	35,332	22.921	29,420	34,860	29,263	41,872
April	33,934	31,503	24.422	28,023	28,160	32,714	47,812
May	35,019	32,869	25.632	37,112	34,371	37,228	49,562
June	33,831	30,926	25,507	36,982	34,504	37,610	50,553
July	36,971	34,690	27,067	36,386	41,164	35,283	—
August	35,129	19,378	24,742	36,810	40,693	34.402	—
September	32,430	20,662	24,003	33,905	35,108	32.481	—
October	35,911	22,359	24.295	34,473	42.165	33,174	—
November	33,943	19,098	27.587	33.429	34,776	34,737	—
December	32,292	20,320	24,904	31,530	29,788	31,547	—
Corrected total for year	411,368	338,634	292,927	393,398	423,614	403,721	—

TOTAL IMPORTS (*including Miscellaneous*).

(000 £'s.)

	1913.	1914.	1915.	1916.	1917.	1918.	1919.
January	71,242	68,005	67,246	74.936	90,593	98,996	134,518
February	63,787	62,054	65,200	67,336	70.948	99,029	107,073
March	61,342	66,947	75,462	86,116	81,146	107.223	105,772
April	62,954	61,627	73,639	75,716	84,533	119,881	112.211
May	61,279	59,009	71,601	83,793	87,626	125,907	135,657
June	58,310	58,282	76,009	86,928	86,079	101,545	122,946
July	61,784	59.376	75,724	76,732	90,125	109,139	—
August	55,976	42.343	69,401	76.091	100,558	110,235	—
September	61,356	45.007	70,286	77.440	86,272	97,975	—
October	71,730	51,379	67,816	81,160	94,258	117,707	—
November	68,467	55,518	71,622	88,935	109,753	116,869	—
December	71,115	67,317	70,327	75,381	84,770	116,192	—
Corrected total for year	768,735	696,635	851,893	948,506	1,064,165	1,316,151	—

TOTAL RE-EXPORTS (*including Miscellaneous*).

January .	10,706	9,597	6,895	8,830	8,431	3,191	4,560
February ..	10,746	10,229	6,810	8,530	8,992	2,740	5,119
March	9,633	9,536	8,067	8,811	7,570	3,192	8,949
April	10,059	10,789	9,957	8,093	8,489	2,141	13,347
May	9,370	10,372	10,243	10,983	6,336	3,400	11,495
June	8,541	8,753	9,350	8,873	6,428	2,115	11,964
July	8,311	7,826	9,409	7,895	4,588	2,022	—
August	8,150	4,420	7,324	7,738	4,534	2.277	—
September	6,853	5,274	7,564	7,121	3,158	1,729	—
October	9,556	7,180	7,163	7,663	4,096	2,119	—
November	8,001	5,643	8,313	7,137	3,749	2,918	—
December	9,729	5,871	7,702	6,019	3,180	3,113	—
Corrected total for year	109,575	95,474	99,062	97,566	69,677	30,945	—

TOTAL EXPORTS (UNITED KINGDOM PRODUCE)—(*including Miscellaneous*).

January	45,446	47,806	28,248	36,757	46,861	41,666	47,343
February	40,173	41,262	26,177	36,336	37,287	39,099	46,915
March	41,690	44,519	30,176	37,598	44,111	36,002	53,108
April	43,053	39,947	32,170	36.818	35,799	40,071	58,482
May	43,858	42,051	33,619	47,024	43,437	44,967	64.345
June	42,837	39,873	33,234	47.275	43,652	45,026	64,562
July	47,164	44.405	34,722	46,323	49.834	43,644	—
August	44,111	24,211	32,439	47,720	49,804	43,522	—
September	42,425	26,674	32,308	43,478	43,244	40,152	—
October	46,623	28,602	31,969	44,715	50,757	42,821	—
November	44,756	24.602	35,639	42,488	43.382	43.219	—
December	43,327	26,279	33,948	39,928	37.141	38.282	—
Corrected total for year	525,245	430.721	384,868	506.280	527,080	501.419	—

The Council, according to precedent, has appointed a Committee of its number to consider the recommendations which should be made to the Government on behalf of the Society in connection with the forthcoming Census of England and Wales. The first meeting took place on July 1, and Professor A. L. Bowley was elected Chairman. A small Committee has also been appointed, at the suggestion of the President, to consider the steps which should be taken to approach the Government with a view to securing an improvement in official statistics. Mr. Geoffrey Drage is the Chairman of this Committee, which began its work early in July. It is proposed to petition Parliament for an official enquiry into the possibilities of improvement and the means whereby it may best be effected.

STATISTICAL AND ECONOMIC ARTICLES IN RECENT PERIODICALS.

UNITED KINGDOM—

Board of Agriculture, Journal. June, 1919—Organisation of the Village: *Newton* (*Sir Douglas*), K.B.E. Report on Farms taken over by Agricultural Executive Committees.

Economic Journal. June, 1919—New Zealand during the War: *Condliffe* (*J. B.*). The Monopoly in Alcoholic Drink: *Eagles* (*J. S.*). Methods of Graduating Taxes on Income and Capital: *Edgeworth* (*Prof. F. Y.*). French War Budgets for 1919-20: *Gide* (*Prof. Ch.*).

Financial Review of Reviews. June, 1919—The Importance of Cheap Power to Industry: *de Brath* (*Stanley*), M.I.C.E. The Perils of Bolshevism: Why the Overthrow of Lenin is Necessary to Britain: *Issaiev* (*V. I.*). Victoria, A National Port: *Todd* (*A. E.*). International Finance and the League of Nations: *Powell* (*Ellis T.*), LL.B., D.Sc. Brazilian Finance—Retrospective and Prospective: *Martin* (*Percy F.*), F.R.G.S. Financial Conditions in Mexico. By our Mexican Correspondent.

Geographical Journal—

June, 1919—Poland: *Czaplicka* (*Miss M. A.*).

August, 1919—Boundary Delimitations in the Treaty of Versailles.

National Temperance Quarterly. Summer, 1919—The Existing State of Scientific Knowledge in Regard to Alcohol: *Neild* (*Theodore*), M.A.

Proceedings of the Royal Society of Edinburgh. Part I. (*Session* 1918-19)—The Endowment of Scientific and Industrial Research: *Horne* (*John*), LL.D., F.R.S.

Royal Society of Arts Journal. June, 1919—London Retail Businesses. Decline in Labour Efficiency in German Mines. The Match Industry in Brazil. Glass-making before and during the War: *Powell* (*Harry J.*).

Transactions of the Royal Society of Edinburgh. Vol. LII. Part II—The Correlation between Relatives on the Supposition of Mendelian Inheritance: *Fisher* (*R. A.*).

United Empire—

June, 1919—British Traits and Ideals in Relation to our Colonial Development: *Leverhulme* (*The Right Hon. Lord*).

July, 1919—Problems of Reconstruction in the Pacific: *Scholefield* (*Guy H.*).

Women's Industrial News. April, 1919—Annual Report, 1917 to 1918. Employment and Substitution of Women during the War: *B. L. H.* Children in Factory Life: *Skinner* (*M.*). The Women's Reward: *Black* (*Clementina*).

India—

Indian Economic Society, Journal. March, 1919—Post-War Finance in England: *Shah* (*K. T.*). Note on the Increase in the Cost of Living in the Deccan: *Mann Harold* (*H.*). The Indian Budget for 1919–1920: *Deole* (*C. S.*). Economic Thought in India: *Shah* (*D. A.*). The Labour Movement in the Western Countries: *Pagar* (*S. M.*).

United States—

Annals of the American Academy of Political and Social Science. July, 1919—(Contains a series of articles entitled International Reconstruction. The main divisions are: I. The future of Turkey and Asia Minor. II. Readjustment in Middle Europe. III. The Present and Future of Russia. IV. The Organisation of Peace.)

American Economic Review. June, 1919—The Revenue Act of 1918: *Blakey* (*Roy G.* and *Gladys C.*). Consideration of the Proposal to Stabilize the Unit of Money: *Knibbs* (*G. H.*), and rejoinder by *Professor Fisher*. An American Standard of Value: *Tinnes* (*D. J.*). The Purposes Achieved by Railroad Reorganization: *Dewing* (*Arthur S.*).

American Journal of Sociology. May, 1919—Influences of the Industrial and Social Revolution upon the Agricultural Industry of America: *Holmes* (*Roy Hinman*). Socializing School Procedure: *Lull* (*H. G.*). The Coming Industrial Democracy: *Yarros* (*Victor S.*). Socialization: *Ross* (*Edward Alsworth*). Have We a Just Standard of Industrial Intelligence: *Selden* (*Frank Henry*). The Origin of Democracy: *Gillin* (*J. L.*).

American Statistical Association. (*Quarterly, June*, 1919)—Is the New Immigration more unskilled than the old? *Douglas* (*Paul H.*). Analysis of the Standards of Living in the District of Columbia in 1916: *Ogburn* (*Wm. F.*). Notes on Professor Ogburn's Analysis of the Standards of Living in the District of Columbia in 1916: *Golden-Weiser* (*E. A.*). How to Figure Labor Turnover: *Crum* (*Frederick S.*). The Italian Factor in the Race Stock of Argentina: *Foerster* (*Robert F.*). The Official Statistics of Japan.

Journal of Political Economy—

May, 1919—What Shall We Do with the Railroads? *Magee* (*James D.*). Farm Products and Cost Accounting: *Davenport* (*H. J.*). Labour Administration in the Shipbuilding Industry during the War, II.: *Douglas* (*P. H.*) and *Wolfe* (*F. E.*).

June, 1919—The Work of the Wage-Adjustment Boards: *Bing* (*Alexander M.*). The American Automatic Tool: *Lloyd* (*Ernest F.*). The Place of Agriculture in Modern Industrial Society, I.: *Nourse* (*Edwin G.*).

July, 1919—The Webb Law—its scope and operation: *Notz* (*William*). Plant administration of Labor: *Douglas* (*P. H.*). The place of Agriculture in modern industrial society, II.: *Nourse* (*E. G.*). Commercial Banking and capital formation: *Watkins* (*Myron, W.*).

UNITED STATES—*Contd.*

Political Science Quarterly. *June*, 1919—The Federation of India: *Houghton* (*B.*). The Expansion of Europe. II.: *Shepherd* (*William R.*). Holland's International Policy: *Van Vollenhoven* (*C.*). Price Fixing in the United States during the War. II.: *Haney* (*Lewis H.*).

Quarterly Journal of Economics. *May*, 1919—Latin American Foreign Exchange and International Balances during the War: *Williams* (*John H.*). Positive Contributions of Scientific Management: *Farquhar* (*Henry H.*). Indebtedness of Principal Belligerents: *Gottlieb* (*Louis Ross*). The Iron-Ore Problem of Lorraine: *Berglund* (*Abraham*). Cost of Production and Price: *Wright* (*Philip G.*). The Relations of Recent Psychological Developments to Economic Theory: *Dickinson* (*Z. Clark*).

FRANCE—

Bulletin de Statistique et de Législation Comparée—

April, 1919—Les Monnaies Fabriquées à la Monnaie de Paris et la circulation monétaire en 1918.

May, 1919—Le commerce extérieur de la France pendant le premier trimestre de 1919.

Bulletin Mensuel de l'Office de Renseignements Agricoles. *October-December*, 1917—Travaux de la Commission chargée de l'étude des questions relatives à l'accroissement du rendement en sucre des betteraves. (Année, 1917.) Dénombrement des animaux de ferme au 1er Juillet 1917. Résultats approximatifs des récoltes de céréales en 1917. Relevé présentant, pour les quatre départements du Midi, gros producteurs de vins, le chiffre de la production en 1917 et le stock des récoltes antérieures.

Journal des Économistes—

June, 1919—La Politique Financière de M. Klotz: *Yves-Guyot.* Le Budget Britannique pour 1919-20: *Williams* (*W. M. J.*). La Question Monétaire en Turquie: *Raffalovich* (*A.*). La Situation bancaire en Roumanie: *Caubone* (*Pierre*). L'Avenir Economique de la Grèce: *Michalacopoulos.*

July, 1919—Une entreprise d'origine française aux États-Unis: *Schelle* (*G.*). Une politique du change: *Mathews* (*Frédéric*). Notes complémentaires concernant les finances publiques de la Grande-Brétagne (1919-20): *Williams* (*W. M. J.*). Le Mouvement des prix avant et depuis la guerre: *Delamotte* (*Gabriel*). Les Menées socialistes et les Nationalisations: *Yves-Guyot.* La Traité de Versailles: *Yves-Guyot.*

Journal de la Société de Statistique de Paris—

June, 1919—La Statistique des élections parlementaires britanniques de décembre 1918: *Dewarrin* (*Maurice*).

July, 1919—Chronique de démographie: *Huber* (*Michael*). L'épargne française et ses placements dans la période d'avant-guerre. Définitions et statistiques: *Papin* (*René*).

La Réforme Sociale.—

May, 1919—Société d'Économie Sociale: *Bienaimé* (*Georges*)

FRANCE—*Contd.*

La Réforme Sociale—Contd.

June, 1919—La Question agraire en Roumanie: *Michel* (*Bernard*).

July, 1919—Le Mouvement Économique et Social: *Blondel* (*Georges*).

Revue d'Économie Politique. May–June, 1919—Les idées économiques et sociales de Giuseppe Mazzini: *Arias* (*Gino*). Le papier-monnaie en Turquie pendant la guerre: *Vergeot* (*Jean*). Le marché cotonnier du Havre pendant la guerre: *Amphoux* (*Etienne*). Les causes de la hausse des prix (suite et fin): *Mourre* (*le baron Charles*). La production agricole française à propos d'un livre récent: *Hitier* (*J.*).

ITALY—

Giornale degli Economista e Rivista di Statistica—

May, 1919—Le Statistiche e le relazioni periodiche nella burocrazia: *Corbino* (*Epicarmo*). L'Imposta sui profitti di guerra: *Nina* (*Luigi*). Gli odierni aspetti dell'economia dei trasporti: *Di Nola* (*Carlo*).

June, 1919—Proposte Italo Francesi sul fronte unico finanziario: *Griziotti* (*Benvenuto*). L'Industria nazionale delle costruzioni navali e il dopo guerra marittimo in Italia: *Guidi* (*Dario*). La situazione del mercato monetario.

Giornale di Matematica Finanziaria. March, 1919—Gli studi sul Credito e su la Previdenza ieri ed oggi in Italia: *Ortu-Carboni* (*S.*). Sulla applicazione probabilità parziali alla statistica: *Cantelli* (*F. P.*). Sulla forma dei segni di algebra: *Peano* (*G.*). Sull'assicurazione obbligatoria contro l'invalidità e la vecchiaia: *Insolera* (*F.*). Su una particolare assicurazione in caso di morte: *Levi* (*E.*).

La Riforma Sociale. May–June, 1919—La via che seguiremo: *Tangorra* (*Vincenzo*). La leva sul capital per il riscatto del debito pubblico: *Edgeworth* (*F. Y.*). La Tubercolosi in Italia: *Livi* (*Livio*). Il controllo amministrativo nella mentalità burocratica: *Corbino* (*Epicarmo*).

SPAIN—

Revista Nacional de Economía—

October–November, 1918—Sobre la organización ecónomica y financiera de las Sociedades de explotación eléctrica: *Mailloux* (*M.*). La carestia de la vida y sus incidencias: *Barthe* (*Andrés*). La moneda y las cuestiones sociales: *Bernacér* (*Germán*). Las communicaciones internacionales de España: *Fajardo* (*José*). Las modernas tarifas de salario: *Simarro Puig* (*A. M.*).

December, 1918—Relación entre la Ingenieria y la Economia: *Hayford* (*John F.*). Ley de expropiación forzosa: *Sánchez Pastor* (*E.*). Carreteras y ferrocarriles: *Romero* (*José Borés*). La liquidacion del presupuesto de 1918. XXX. El factor ecónomico en la vida social: *Andre* (*Eloy Luis*).

LIST OF ADDITIONS TO THE LIBRARY.

Since May, 1919, the Society has received the publications enumerated below.

A further list is appended of the periodical publications received during the year, August, 1918, to July, 1919.

I. OFFICIAL PUBLICATIONS.

(a) United Kingdom and its several Divisions.

United Kingdom—

Royal Commission on the Income Tax. First and second instalments of the Minutes of Evidence with Appendices. 2 Vols. 250 + 104 pp., fol. 1919. 2*s*. each vol. (The Commission.)

(b) India and Dominions.

India—

Gazetteers. Coorg District Gazetteer. B Volume. 26 pp. 1918. 9*d*. (India Office.)

Shahabad District Gazetteer. B Volume. (*Id.*)

Statistics. 1900–01 to 1910–11. 43 pp., 4to. 1918. 1*s*. 2*d*. (*Id.*)

Trade. Review of the Trade of India in 1917–18 (East India.) 82 pp., fol. 1919. 1*s*. net. (*Id.*)

Australia—

Census of the Commonwealth of Australia. Appendix A. Vol. 1. 468 pp., fol. Melbourne, 1919. (Government Statistician.)

Federated Malay States—

Manual of Statistics. 1919. 210 pp., 8vo. 1919. (Government Printing Office.)

New Zealand—

Census. Results of a Census of the Dominion of New Zealand, October 15, 1916 Part IX. Occupations and Unemployment. 174 pp., fol. Wellington, 1918. (Census and Statistics Office.)

—— Results of a Census of the Dominion of New Zealand, October 15, 1916. Part XI. Dwellings. 52 pp., fol. Wellington, 1918. (*Id.*)

Union of South Africa—

Final Report of the Miners' Phthisis Prevention Committee. Johannesburg, January 10, 1919. 110 pp., 4to. Pretoria, 1919. (Union Government.)

(c) Foreign Countries.

Belgium—

Census of Production. Recensement de l'Industrie et du Commerce. 31 déc. 1910. Vol. v, 789 pp., 4to. Bruxelles, 1919. (Ministère de l'Industrie et du Travail.)

China—

Return of Trade and Trade Reports, 1918. Part III. Analysis of Foreign Trade. Vol. i. Imports. 521 pp., 4to. Shanghai, 1919. $3. (Inspectorate Gen. of Customs.)

(c) Foreign Countries—*Contd.*

France—

La Constitution de L'Office Départemental du Placement et de la Statistique du Travail de la Seine. Son action et ses travaux, du 1er Nov. 1915 au 30 Oct. 1918. 432 pp., 4to. Paris, 1918. (Services de la Statistique.)

Peru—

Reply to the Circular from the Chilian Chancellery, Jan. 12, 1919. 30 pp., 4to. 1919. (London, Whitefriars Press, Ltd.)

Spain—

Estadística del Suicidio en España, 1912–1917. 13 pp., 8vo. Madrid, 1919. (Institut Géographique et Statistique.)

United States—

Department of Agriculture. Bulletin No. 754. Inheritance of Waxy Endosperm in Maize. By J. H. Kempton. 99 pp., 8vo. Washington, 1919. (The Department.)

—— Bulletin No. 755. Geographical Phases of Farm Prices: Oats. 28 pp., 8vo. Washington, 1919. (*Id.*)

Bureau of the Census. Bulletin 137. Cotton Production and Distribution, Season of 1917–18. 135 pp., 8vo. Washington, 1918. Price 15 cents. (The Bureau.)

Children's Bureau. Publication No. 33. Rural Children in Selected Counties of North Carolina. By Frances Sage Bradley and Margaretta A. Williamson. 116 pp., 8vo. Washington, 1918. (The Bureau.)

—— Publication No. 43. Children before the Courts in Connecticut. By Wm. B. Bailey. 98 pp., 8vo. Washington, 1918. (*Id.*)

Bureau of Labour Statistics. Whole No. 232. May, 1918. Wages and Hours of Labour in the Boot and Shoe Industry: 1907 to 1916. 164 pp., 8vo. Washington, 1918. (The Bureau.)

—— Whole No. 233. July, 1918. Operation of the Industrial Disputes Investigation Act of Canada. By Benjamin M. Squires. 169 pp., 8vo. Washington, 1918. (*Id.*)

Department of Labour. Committee on Mortality from Tuberculosis in Dusty Trades, Preliminary Report. 27 pp., 8vo. 1919. (The Department.)

II. AUTHORS AND MISCELLANEOUS.

Agger (*E. P.*). Organized Banking. 385 pp., 8vo. London, 1919. (Allen and Unwin.) 12*s.* 6*d.* (The Publishers.)

Brož (*Aleš*). The Rise of the Czecho-Slovak Republic. 31 pp., 8vo. Twentieth Century Press Co. Price 3*d.* (The Author.)

—— Vers un Socialisme Nouveau en Bohème. 8 pp., 8vo. (Groupe Socialiste Tchéco-lovaque.) 50 centimes. (*Id.*)

Cannan (*Edwin*). Coal Nationalization. Précis and Evidence offered to the Coal Industry Commission. 36 pp., 4to. London. 2*s.* (P. S. King.)

Chisholm (*G. G.*). The Geographical Pre-requisites of a League of Nations. (Reprinted from the *Scottish Geographical Magazine*, July, 1919.) 9 pp., 8vo. (The Author.)

Commerce and Industry. Historical Review. A Historical Review of the Economic Conditions of the British Empire from the Peace of Paris in 1815 to the Declaration of War in 1914, based on Parliamentary Debates. Edited by William Page. 492 pp., 8vo. Constable and Co. 1919. Price 24*s.* (The Publishers.)

—— Statistical Tables. Tables of Statistics for the British Empire from 1815. 238 pp., 8vo. Constable and Co. 1919. Price 24*s.* (*Id.*)

Dall (*W. H.*). Spencer Fullerton Baird. A Biography. 461 pp., 4to. 1915. (Smithsonian Institute).

Döring (*C.*). Die Bevölkerungsbewegung im Weltkrieg. II. Oesterreich-Ungarn. (Bulletin der Studiengesellschaft für Sociale Folgen des Krieges. No. 5.) 82 pp., 8vo. Kopenhagen. 1919. Price 3 kr.

II. Authors and Miscellaneous—*Contd.*

Dublin (L. I.), etc. Mortality Statistics of Insured Wage-Earners and their Families. 397 pp., 8vo. New York, 1919. (Metropolitan Life Insurance Co.)

Guldberg (*Alf.*) Calcul des Probabilités. Sur les erreurs de situation d'un point. 4 pp., 4to. Paris, 1919. (The Author.)

Harris (*Walter B.*) *and Cozens-Hardy* (*The Hon. W., K.C., M.P.*). Modern Morocco. A Report on Trade Prospects, with some Geographical and Historical Notes compiled for the Bank of British West Africa, Ltd. 267 pp., 8vo. 1919. (The Bank.)

Hoffman (*F. L.*). Scientific Publications of the Prudential Insurance Co. of America 1916–17. 138 pp., 8vo. 1916. (Prudential Insurance Co.)

—— Scientific Publications of the Prudential Insurance Co. of America. 1918–19. 458 pp., 8vo. 1918. (*Id.*)

Hobson (*J. A.*). Taxation in the New State. 254 pp., 8vo. London, 1919, (Methuen and Co.)

Lloyd's Register of Shipping. Notes on the 1919–20 edition. 7 pp., 4to. London, 1919.

Madsen (*A. W.*). House Famine and the Land Blockade. 47 pp., 8vo. London. United Committee for the Taxation of Land Values, 1919. 1*d.* (The Author.)

Marchetti (*Livio*). The Economic Revival of Italy. 91 pp., 4to. Torino, 1918. (Banca Commerciale Italiana, London.)

Martin (*A. J.*). The £. What is it? 14 pp., 8vo. London. St. Catherine Press, 1919. 6*d.* (The Author.)

Prato (*Giuseppe*). Riflessi storici della Economia di guerra. 226 pp., 8vo. Bari, 1919. (Gius. Laterza and Figli.)

Said-Ruete (*Rudolph*). Politische Korrespondenzen und Friedfertige Kriegsaufsätze, 1914–1918. 193 pp., 4to. Zurich, 1919. (Art. Institut. Orell Füssli.)

Scott (*Leslie, K.C., M.P.*). A Leap in the Dark. Speech as Counsel for the Royalty Owners and the Mining Association of Great Britain before the Coal Industry Commission. 138 pp., 8vo. London, 1919. (The Coal Association.)

Spalding (*W. F.*). Primer of Foreign Exchange. 107 pp., 8vo. London, 1919. 3*s.* 6*d.* (Pitman.)

Tittoni (*Tommaso*). Conflitti politici e Riforme costituzionali. 270 pp., 8vo. Bari, 1919. (Gius. Laterza and Figli.)

Todd (*John A.*). The Mechanism of Exchange. A Handbook of Currency, Banking and Trade in Peace and in War. 263 pp., 8vo. Oxford University Press. 1919. 7*s.* 6*d.* (Humphrey Milford.)

ANNUAL LIST OF ADDITIONS TO THE LIBRARY.

Since the end of July, 1918, the Society has received the periodical publications enumerated below. They are arranged alphabetically by subjects (works of a general nature coming first).

(a) United Kingdom and its several Divisions.

United Kingdom—

Statistical Abstracts for the United Kingdom for 1916 and for the Dominions and Colonies for 1915. Reports or Returns dealing with Agriculture, Army, Assurance Companies, Bankruptcy, Companies, Customs and Excise, Ecclesiastical Commissioners, Education, Friendly Societies, Inland Revenue, Labour, Lunacy, Local Government, Mines, Mint, Police, Post Office, Prisons, Railways, Trade and Navigation, Woods and Forests.

Great Britain—

The publications of the Board of Agriculture and Fisheries.

England and Wales—

Reports and Returns dealing with Births, Deaths and Marriages, Charities, Education, Justice, Local Taxation, Pauperism, Police.

London County Council. Such Statistical Publications as have been issued.

Metropolitan Asylums Board. Report.

Metropolitan Water Board. Report.

Municipal Accounts of Birmingham, Hull, Ipswich, Leicester, London (Islington), Manchester, Nottingham.

Reports of Medical Officers of Health of Birkenhead, Birmingham, Liverpool, Manchester, Poplar, Preston, Wigan, Wolverhampton.

Calendars of the Universities of Durham, Liverpool, London, Manchester.

Ireland—

The publications of the Department of Agriculture and Reports relating to Births, Deaths and Marriages, Education, Emigration, Justice, Local Government, Lunacy, &c.

Calendars of Universities of Belfast and Dublin.

Scotland—

Reports, &c., on Agriculture, Births, &c., Education, Justice, Lunacy, &c.

Edinburgh. Municipal Accounts.

Reports of Medical Officers of Health of Edinburgh, Aberdeen and Glasgow.

Calendars of the Universities of Edinburgh and Glasgow.

Societies, &c. (British).

British Association, Report. Corporation of Foreign Bondholders, Report. East India Association, Journal. Institute of Actuaries, Journal. Institute of Bankers, Journal. Institute of Chartered Accountants. Iron and Steel Institute, Journal. Imperial Institute, Journal. Jews, Annual Report and Accounts of United and Constituent Synagogues. Jews, Board of Guardians for Relief of Jewish Poor, Annual Report. Liverpool, Chamber of Commerce, Annual Report. Lloyd's Register of British and Foreign Shipping, Statistical Tables. London Chamber of Commerce, Journal. Manchester Statistical Society, Journal. Peabody Donation Fund, Report of Governors. Royal Agricultural Society of England, Journal. Royal Anthropological Institute, Journal. Royal Asiatic Society, Journal. Royal College of Physicians of London, List of Fellows, &c. Royal College of Surgeons of England, Calendar. Royal Colonial Institute, United Empire. Royal Geographical Society, Geographical Journal.

(a) **United Kingdom and its several Divisions**—*Contd.*

Societies, &c. (British)—*Contd.*

Royal Institution, Proceedings. Royal Meteorological Society, Meteorological Journal. Royal Philosophical Society of Glasgow, Proceedings. Royal Society, Proceedings. Royal Society of Edinburgh, Proceedings. Royal United Service Institution, Journal. Sanitary Institute, Journal. Society of Arts, Journal. Society of Comparative Legislation, Journal. Society for Propagation of Gospel in Foreign Parts, Report. Statistical and Social Inquiry Society of Ireland, Journal. Surveyors' Institution, Professional Notes and Transactions. Trade Circulars.

Periodicals, &c., and Miscellaneous (British) for 1918–19.

Brewers' Almanack and Wine and Spirit Trade Annual. Licensed Victuallers' Official Annual. Newspaper Press Directory. Post Magazine Almanack. Statesman's Year-book. Stock Exchange Official Intelligence. Banking Almanack. Bourne's Insurance Directory. British Almanac and Companion. Burdett's Hospitals and Charities. Daily Mail Year-book. Hazell's Annual. Imperial Tariff. Insurance Register. Insurance Year-book. Municipal Year-book. Shipping World Year-book. Times, Index. Whitaker's Almanack. Who's Who Year-book. Year-book of Learned Societies. Ellison's Cotton Trade Circulars. S. Figgis and Co., Annual Review of India Rubber Market. Thos. Gooch and Sons, Importation of Colonial and Foreign Wool into London, Liverpool, Hull and other Ports. Maclean and Henderson, Review of Insurance Share Market. Pixley and Abell, Annual Circular relating to Imports and Exports and Prices of Bullion. Schwartz, Buchanan and Co., Annual Report on Wool. William Tattersall's Cotton Trade Circulars. W. Weddel and Co., Annual Review of Frozen Meat Trade. South Wales Coal Annual. United Society of Boilermakers and Iron Shipbuilders, Monthly Reports, and other periodicals. Annual Register.

The Accountant. Accountants' Magazine. Associated Accountants' Journal. Athenæum. Bankers' Magazine. Biometrika. Broomhall's Corn Trade News. Colliery Guardian. Commercial World. Economic Journal. Economist. Eugenics Review. Farmers' Club Journal. Fireman. Finance Chronicle. Financial Review of Reviews. Illuminated Engineer. Insurance Record. Insurance Times. Investors' Monthly Manual. Land Values. London County Council Gazette. Machinery Market. National Temperance Quarterly. Nature. Navy League, Journal. Policy-Holder. Post Magazine. Public Health. Publishers' Circular. Returns of Pauperism. The Secretary. Statist. Stock Exchange Gazette. The Times. Wallis Index numbers. Women's Industrial News.

(b) **India, Dominions and Colonies.**

India—

Statistical Abstract for 1915–16. Agricultural Statistics for 1916–17 and for 1917–18 (Summary Tables). Cotton Spinning Returns. Currency Department Report for 1917–18. Education Statistics for 1916–17. Mines, Report on, for 1917. Trade and Navigation (Inland and Foreign) Returns for 1917–18.

Bengal. Trade and Navigation Returns for 1917–18 and for 1918–19.

Central Provinces. Judicial Statistics for 1917.

Punjab. Public Health Report for 1917.

East India Railway. Reports for 1918–19. Wealth of India. Indian Journal of Economics.

Australia, Commonwealth of—

Parliamentary Debates, Session, 1918. Bulletins dealing with Education, Finance, Labour, Production, Trade Returns for 1916–18.

New South Wales. Statistical Register for 1915–16 (1 vol. bound) and for 1916–18 in parts. Financial Statement, 1918. Mines Department, Report for 1916. Railways and Tramways, Report for 1917–18.

(b) India, Dominions and Colonies—*Contd.*

Australia, Commonwealth of—*Contd.*

South Australia. Statistical Register for 1916–17. Births, &c., Report for 1917. Statesman's Pocket Year-book, 1918. Public Library, Museum, &c., Report for 1917–18.

Tasmania. Statesman's Pocket Year-book for 1918. Railway Returns for 1917–18.

Victoria. Victorian Year-book for 1917–18 (in parts).

Western Australia. Statistical Register for 1917–18 (in parts). Quarterly Statistical Abstract, 1918. Friendly Societies Report for 1917–18.

Canada, Dominion of—

Canada Year-book for 1918. Agriculture, Reports and Returns for 1917–18. Finance Accounts for 1916–17. House of Commons Debates, 1918. Labour Returns for 1917–18. Militia, Report on, for 1917–18. Penitentiaries, Report on, for 1916–17. Public Works, Report for 1917–18. Secretary of State's Report for 1916–17. Topographical Survey Report for 1916–17. Trade Returns for 1917–18.

Manitoba.

Ontario. Agricultural Department Publications, 1917–18. Education Report, 1917. Bureau of Industries, Report for 1917.

Quebec Province. Statistical Year-book, 1918.

Ceylon—

Railway Report for 1917. Vital Statistics for 1917.

East Africa Protectorate—

Railway Report for 1917–18.

Jamaica—

Vital Statistics for 1917.

Mauritius—

Blue Book for 1917.

New Zealand—

Official Year-book for 1917. Statistics of the Dominion for 1917. Labour Reports. *Wellington*, Harbour Board Accounts for 1917–18. New Zealand Institute, Proceedings for 1917.

Nigeria—

Lagos Customs and Trade Journal.

Rhodesia—

Chamber of Mines, Reports and Returns for 1917–18.

Straits Settlements—

Federated Malay States Government Gazette, 1918–19.

Union of South Africa—

Official Year-book, 1917. Mines, Report on, for 1917. Social Statistics for 1917. Vital and Health Statistics for 1916. Trade Returns, 1918–19.

Transvaal. Chamber of Mines, Report and Returns for 1917–18.

Johannesburg. Chamber of Commerce, Year-book and Returns for 1917–18.

(c) Foreign Countries.

Argentine Republic—

Trade Returns (quarterly and annual) for 1916–18.

Buenos Ayres (City). Bulletin of Municipal Statistics, 1918–19.

Santa Fé (City). Bulletin of Municipal Statistics, 1918–19.

Belgium—

Bulletin of Economic Information, 1918–19. Labour Review, 1919.

(c) **Foreign Countries**—*Contd.*

Brazil—

Trade Returns for 1917–18. Production of Maize, 1916–17. Returns of Banking, etc., 1918–19.

Chile—

Statistical Year-book for 1916–17 (in parts).

China—

Post Office Report for 1917. Trade Returns (Annual and Quarterly) for 1917–18.

Cuba—

Financial Statistics for 1913–17 (1 vol.). Immigration Returns. Report on Sugar Industry, 1916–17. Trade Returns for 1917.

Denmark—

Statistical Year-book for 1918. Statistical Miscellany for 1918. Nationalokonomisk Tidsskrift, 1918. Statistiske Efterretninger, 1918–19.

Copenhagen. Annual Health Report for 1917. Vital Statistics (weekly) for 1918–19.

Egypt—

Statistical Year-book for 1917. Cotton Crop Monthly Statistics, 1917–18. Financial Report on the Public Debt for 1918–19. Trade and Navigation (Annual and Monthly) Returns for 1918–19. Vital Statistics for 1918–19. L'Égypte Contemporaine for 1918–19.

Finland—

Statistical Year-book for 1916-17. Banking Statistics for 1916. Electoral Statistics for 1916. Emigration Returns for 1916. Movement of Population in 1913-14. Poor Relief Statistics for 1913. Savings Banks Statistics for 1915. Shipping and Navigation Returns for 1914–15. Trade Returns for 1914–15. Suomi Life Insurance Company's Report for 1917.

France—

Statistical Year-book. Bulletin of General Statistics for 1918–19. Agricultural Statistics for 1916. Bulletin of Ministry of Agriculture. Bulletin of Statistics of Ministry of Finance, 1918–19. Bulletin of Labour, 1919. Movement of Population in 1915-17. Taxation Returns dated 1918. Trade and Navigation Returns (annual) for 1915, monthly for 1918–19. Bank of France Report for 1918.

Colonies. Navigation Returns for 1915.

Paris. Municipal Statistics, 1918. Journal of Statistical Society of Paris for 1918–19. Year-book of the Society for 1919.

Circulaire Commerciale des Métaux et Minérals de Maurice Duclos. Économiste Français. Journal des Économistes. Monde Économique. Polybiblion. Réforme Sociale. Le Rentier. Revue d'Économie Politique.

Greece—

Commission Financière Internationale. Report for 1918.

Iceland—

Agricultural Statistics for 1916. Education Returns (Primary Schools) for 1914–15. Electoral Returns for 1916–17. Trade Returns for 1914.

Italy—

Statistical Year-book. Movement of Population in 1916 (Preliminary figures). Trade Returns (annual) for 1916, monthly for 1918–19. Vital Statistics, 1918. Banca Commerciale Italiana, Report for 1918.

Rome. Labour Bulletin, 1918–19.

Genoa. Bulletin of Health Statistics, 1919.

Milan. Statistical Year-book for 1917. Monthly Statistics, 1918–19.

L'Economista. Giornale degli Economisti. Rivista Italiana di Sociologia. Riforma Sociale. Revue des Nations Latines. La Vraie Italie.

(c) **Foreign Countries**—*Contd.*

Japan—

Statistical Abstract dated 1919. Financial and Economic Annual for 1918. Causes of Death in 1915. Movement of Population in 1915 and 1916.

Tokyo. Annual Statistics dated 1918. Journal of Statistical Society of Tokyo.

Netherlands—

Statistical Year-book for 1917. Statistical Year-book for the Colonies for 1916. Revue mensuelle du Bureau Central de Statistique, 1918–19. Maandcijfers for 1918. Children, Returns in regard to Protection of, in 1915. Financial Statistics (State) for 1916. Judicial Statistics for 1911–16. Labour: Statistics of wages and hours of labour in various trades, 1914, 1917. Movement of Population in 1917, and monthly returns for 1918–19. Poor Relief Returns for 1916. Mortgage Statistics for 1913–17. Shipping Statistics for 1917–18. The Pioneer (Trade and Shipping organ), 1918–19.

Norway—

Statistical Year-book for 1917. Housing Statistics for 1917. Industries for 1916. Insurance Returns for 1916. Judicial Statistics for 1914 and 1915. Movement of Population, 1911–15. Municipal Statistics (Finance) for 1911–15. Postal Statistics for 1917. Prison Statistics for 1915. Railway Returns for 1916–17. Public Health Report for 1915. Social Statistics for 1918–19. Telegraphs and Telephones, Statistics of, for 1916–17. Trade and Navigation Returns for 1916, and monthly returns for 1917–18.

Christiania. Statistical Year-book for 1917.

Paraguay—

Bulletin of Statistics, 1918.

Peru—

Trade Returns for 1917.

Portugal—

Agricultural Statistics for 1916. Financial Returns (Taxation, &c.) for 1915–16. Trade and Navigation Returns for 1915. Judicial Statistics for 1912–16. Movement of Population, 1912–16. Trade and Navigation Returns for 1915–16.

Salvador—

Statistical Year-book for 1917.

Siam—

Statistical Year-book for 1918.

Spain—

Trade Returns. Statistical Year-book for 1917. Trade Returns (monthly) for 1918–19. Customs and Taxation Returns, 1917–18.

Madrid. Vital Statistics, 1918–19.

Barcelona. Bulletin of "Museu Social," 1918. Report of Labour Exchange for 1918.

Revista Nacional de Economia, 1918.

Sweden—

Statistical Year-book, 1917. Annual Statistics for 1917–18 dealing with:—Agriculture, Banking, Building, Co-operation, Cost of Living, 1913–14, Education, Finance, Fisheries, Forests, Immigration, Industries, Labour, Land Surveys, Lunacy, Mines, Municipal Finance, Pilotage, Post Office, Prisons, Public Health, Railways, Seamen, Savings Banks, Social Statistics, Telegraphs, Trade and Navigation, Transport.

The "Statistisk Tidskrift." The "Economisk Tidskrift."

(c) **Foreign Countries**—*Contd.*

Switzerland—

Statistical Year-book for 1917. Statistics of the Régie des Alcools. Assurance Companies, Reports on, for 1915. Trade Returns (annual) for 1917, and quarterly for 1918–19. Report on Commerce and Industry of Switzerland in 1917. Vital Statistics, 1918–19. Société de Banque Suisse, Bulletins, 1918–19.

Berne (Canton). Census of Live stock, 1918.

Zürich—Statistical Year-book for 1916.

United States—

Statistical Abstract for 1917. Agriculture: Publications of Department of, 1918. Children's Bureau, Publications, 1918. Cotton Production, 1917. Comptroller of Currency's Report, 1917. Bureau of Education, Reports and Leaflets, 1918. Immigration, Report of Commissioner, 1918. Internal Revenue Returns, 1917–18. Inter-state Commerce Commission Report, 1918. Mint, Report of Director for 1917–18. Navigation, Report of Commissioner of, for 1917–18. Public Health Returns, &c., 1918–19. Railway Statistics for 1915–16. Trade Returns for 1916–17. Vital Statistics (Births), 1916. Vital Statistics (Mortality), 1916.

California. Agricultural Report for 1917. University Chronicle.

Connecticut. Health Bulletins.

New York (State). Labour Department Reports.

Chicago. Board of Trade Report. John Crerar Library Report.

New York City. Bulletin of Public Library.

Philadelphia. Museums Report for 1916–17.

American Journal of Sociology. Commercial America. Bankers' Magazine. Bradstreet's. Commercial and Financial Chronicle, with Supplements. Duns' Review. Inter-America. Journal of Political Economy. Political Science Quarterly. Quarterly Journal of Economics. Yale Review. American Academy of Political and Social Science, Annals. American Economic Review. American Statistical Association, Quarterly Publications. American Philosophical Society, Proceedings and Transactions. Smithsonian Institution Publications. Harvard University Official Register.

Uruguay—

Statistical Year-book for 1916. Bulletin of Economic Information, 1918–19.

Montevideo. Shipping Statistics.

International—

International Agricultural Institute, Publications, 1918–19.

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